TECHNOLOGY DEPT.

December 10, 1941

NATIONAL PETROLEUM NEWS

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DEC 11 1941
DETROIT

Lead Shortage Indicates Lower Octane For Regular Gasoline

Discussion with refiners shows that present reduction of 30% in tetraethyl lead receipts in 1942 will result in a regular grade gasoline of 3 to 5 points lower octane number. The problem is one for each individual company R-385

Means for Alleviating Lead Restriction Are Proposed to Washington By Refiners

Oil industry offers to operate the marginal lead mines, now closed down because of low price for pig lead, thus assuring an adequate supply of the most important compound for tetraethyl lead, emphasizing that the cost of gasoline to the consumer will not be affected 9

Standardized Engine Test For Heavy Duty Motor Oils

Co-operation between automotive and refinery laboratories results in one test procedure to measure oxidation and corrosion characteristics..R-387

New Process for Making Aviation Gasoline Base Stocks from Naphtha

Isomerization method announced by Standard Oil Co. of Indiana improves quality of base stocks, making smaller proportion of blending agent necessary, thereby increasing the nation's potential supply of high-octane aviation fuel 18

REFINING TECHNOLOGY EDITION

MORRISON BROS. COMPANY
OIL EQUIPMENT HEADQUARTERS
DUBUQUE, IOWA

COMING MEETINGS

DECEMBER

National Highway Transportation Show, Convention Hall, Philadelphia, Pa., Sat.-Fri., Dec. 6-12.

Interstate Oil Compact Commission, Annual Meeting, Oklahoma City, Okla., Fri.-Sat., Dec. 19-20.

JANUARY, 1942

Society of Automotive Engineers, Annual Meeting (and Engineering Display) Book Cadillac Hotel, Detroit, Mich., Mon.-Fri., Jan. 12-16.

FEBRUARY

Kentucky Petroleum Marketers, 16th Annual Meeting, Brown Hotel, Louisville, Ky., Wed.-Thurs., Feb. 11-12.

Iowa Independent Oil Jobbers' Assn., Annual Convention, Hotel Fort Des Moines, Des Moines, Ia., Wed.-Fri., Feb. 25-27.

American Petroleum Institute, Div. of Production, Southwestern District, Spring Meeting, Adolphus Hotel, Dallas, Tex., Thurs.-Fri., Feb. 26-27.

North Texas Oil & Gas Assn., Wichita Falls, Tex., Sat., Feb. 28.

MARCH

Indiana Independent Petroleum Assn., Spring Convention and Refiners' and Suppliers' Exhibit, Hotel Severin, Indianapolis, Ind., Tues.-Thurs., March 3-5.

American Society for Testing Materials, Committee Week and Spring Meeting, Cleveland, Ohio, Mon.-Thurs., March 2-5.

Illinois Petroleum Marketers Assn., Annual Convention, Hotel Pere Marquette, Peoria, Ill., Tues.-Thurs., March 10-12.

Wisconsin Petroleum Assn., Annual Convention and Equipment Show, Schroeder Hotel, Milwaukee, Wis., Wed.-Fri., March 18-20.

American Society of Mechanical Engineers, Spring Meeting, Houston, Tex., Mon.-Wed., March 23-25.

Western Petroleum Refiners Assn., 30th Annual Meeting, St. Charles Hotel, New Orleans, La., Mon.-Wed., March 23-25.

APRIL

American Institute of Mining & Metallurgical Engineers, Cincinnati, O., Wed.-Fri., April 15-17.

National Petroleum Assn., 39th Semi-Annual Meeting, Hotel Cleveland, Cleveland, O., April 16-17.

American Assn. of Petroleum Geologists, 27th Annual Meeting, Cosmopolitan Hotel, Denver, Colo., Tues.-Fri., April 21-24.

Petroleum Industry Electrical Assn., Washington-Youree Hotel, Shreveport, La., Wed.-Fri., April 22-24.

MAY

Natural Gasoline Assn. of America, 21st Annual Convention, Mayo Hotel, Tulsa, Okla., Wed.-Fri., May 13-15.

International Petroleum Exposition, Tulsa, Okla., Sat.-Sat., May 16-23.

JUNE

American Society of Mechanical Engineers, Semi-Annual Meeting, Cleveland, Ohio, Mon.-Thurs., June 8-11.

American Society for Testing Materials, Chalfonte-Haddon Hall, Atlantic City, N. J., Mon.-Fri., June 22-26.

OCTOBER

American Society of Mechanical Engineers, Fall Meeting, Rochester, N. Y., Mon.-Wed., Oct. 12-14.

NOVEMBER

American Petroleum Institute, 23rd Annual Meeting, Stevens Hotel, Chicago, Ill., Mon.-Fri., Nov. 9-13.

American Chemical Society, National Chemical Exposition and National Industrial Chemical Conference, Stevens Hotel, Chicago, Ill., Tues.-Sat., Nov. 17-21.

American Society of Mechanical Engineers, Annual Meeting, New York, N. Y., Mon.-Fri., Nov. 30-Dec. 4.

NATIONAL PETROLEUM NEWS

DECEMBER 10, 1941

NEWS

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NEWS BUREAUS

New York, 50 W. 50th Street, Telephone Columbus 5-1516 and 5-1517.

Washington, D. C., 803-805 National Press Bldg., Telephone, NAtional 0654.

Tulsa, Okla., 904 World Bldg., Telephone, 3-7132.

Los Angeles, 610-A Hillstreet Bldg., 815 South Hill Street Telephone, VAndike 2845.

Chicago, 59 E. Van Buren Street Telephone, Harrison 5901-2-3.

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THIS WEEK WITH NPN

NPN ON 'FIRING LINE'

Outbreak of war finds NPN and *Oilgram* staffs ready to serve the petroleum industry with up-to-the-minute news from Washington — news oil men will need to guide their business operations under the new and heavier impact that has changed U. S. aims from "war defense" to the job of battling the real thing. In addition to NPN's regular staff of three full-time reporters, News Editor A. M. Petty is again on deck to direct the Washington bureau.

TRAINING

An Alberta, Canada, oil marketer who has been following articles published in NPN on various training programs, writes NPN for information and help. This marketer is instituting a school for his dealers and asks NPN to suggest sources of supply for training manuals, which could be used as a text book in the course. NPN gladly complied by sending a list of available sources where such information could be secured.

BOOKS

From time to time, NPN lists books of interest to oil men. And that the oil industry is actively interested in improving its knowledge of the various branches of activity, is shown in the orders received, not for one, but for quantities of books. A sample of this was the order received from one oil company for $20 worth of books announced in NPN recently.

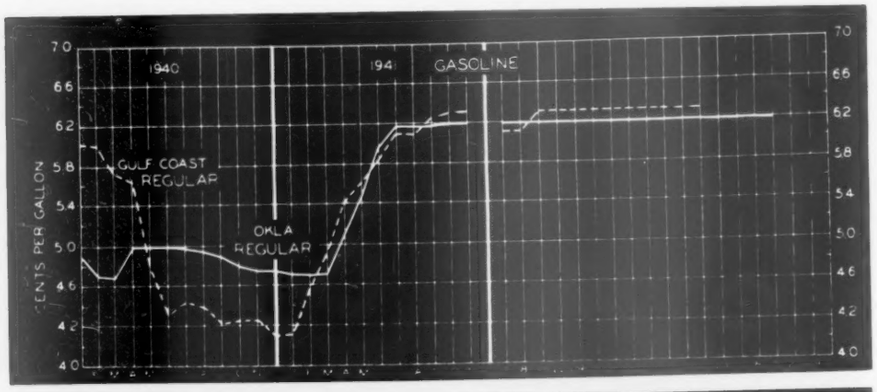
AUSTRALIA

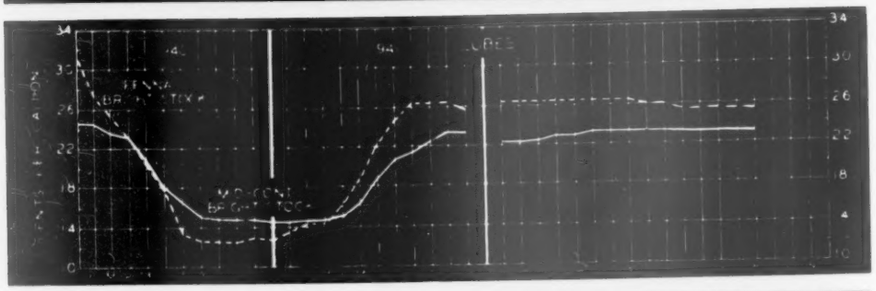
An oil marketing company in Australia, with an eye to the future, writes NPN for further information regarding manufacturers of equipment for wheel balancing and for the names of makers of other equipment they can use in their business.

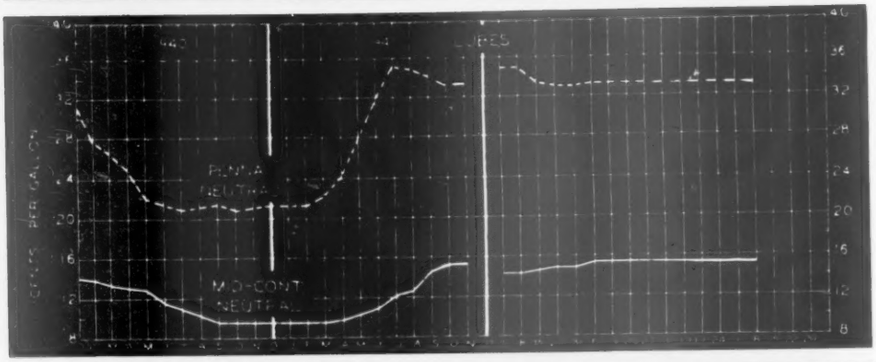
STATISTICS

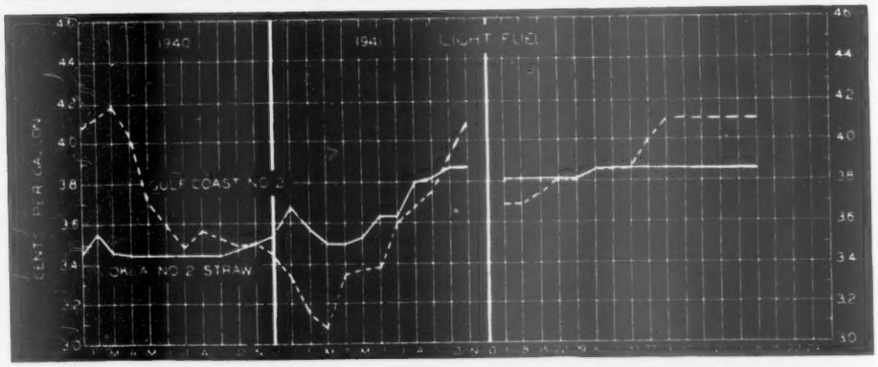
Refinery Prices

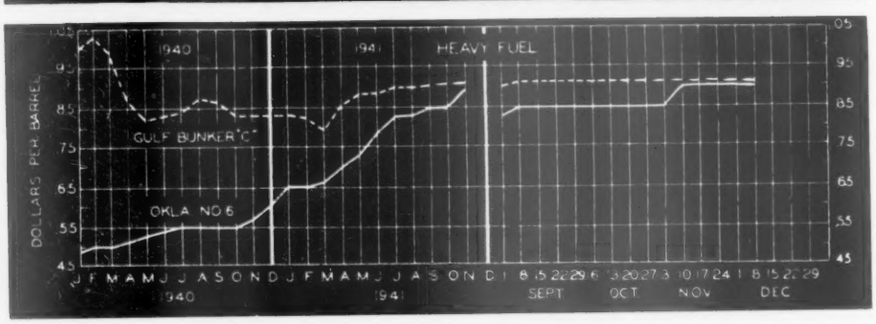
Monthly prices in graphs are averages of daily high and low prices shown in Platt's Oilgram Weekly prices are averages of high and low prices shown in Monday Oilgram, and in NPN










1940
1941
HEAVY FUEL
GULF BUNKER 'C'
OKLA NO 6
DOLLARS PER BARREL
J F M A M J J A S O N D J F M A M J J A S O N D 1 8 15 22 29 6 13 20 27 3 10 17 24 1 8 15 22 29
1940
1941
SEPT
OCT
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DEC

N. P. N. Gasoline Index

	Dealer T. W.	Tank Car
	Cents per Gallon	
Dec. 8	10.02	6.80*
Month ago	10.05	6.77
Year ago	8.53	5.03

Dealer index is an average of "undivided" dealer prices, ex-tax, in 50 cities.

Tank car index is a weighted average of following wholesale markets for regular-grade gasoline, FOB refineries or terminals: Okla., Mid-Western, W. Penna., Calif., N. Y. Harbor, Philadelphia, Jacksonville, Boston, Gulf Coast.*

*Beginning Nov. 17 Gulf Coast Min. 80 octane ('39 Research) substituted for 72-74 octane (ASTM).

Gasoline Consumption By States, September 1941

(American Petroleum Institute figures in thousands of gallons)

	September 1941	September 1940	% of Change
Ala.	30,452	22,895	+33.01
Ariz.	11,030	9,091	+21.33
Ark.	19,959	16,774	+18.99
Calif.	197,162	163,236	+20.78
Colo.	24,305	21,698	+12.01
Conn.	36,394	34,743	+ 4.75
Del.	5,883	5,656	+ 4.01
Dist. of Col.	15,387	14,496	+ 6.15
Fla.	33,957	28,598	+18.74
Ga.	37,347	33,705	+10.81
Idaho	11,722	10,373	+13.00
Ill.	143,104	132,114	+ 8.32
Ind.	72,752	62,804	+15.84
Ia.	54,812	48,648	+12.67
Kans.	48,782	46,365	+ 5.21
Ky.	28,368	25,047	+13.26
La.	29,474	23,190	+27.10
Me.	16,362	15,323	+ 6.78
Md.	31,634	27,644	+14.43
Mass.	68,504	64,932	+ 5.50
Mich.	119,342	107,594	+10.92
Minn.	55,383	71,040	−22.04
Miss.	23,259	20,859	+11.51
Mo.	68,211	62,814	+ 8.59
Mont.	13,243	12,164	+ 8.87
Nebr.	22,619	18,306	+23.56
Nev.	4,870	4,286	+13.63
N. H.	9,500	8,890	+ 6.86
N. J.	82,536	80,060	+ 3.09
N. Mex.	9,995	9,881	+ 1.15
N. Y.	177,000	178,231	− 0.69
N. C.	48,921	40,779	+19.97
N. D.	16,864	15,627	+ 7.92
Ohio	146,812	127,770	+14.90
Okla. (a)	.....	.....	.....
Oreg.	28,389	24,345	+16.61
Pa.	146,502	139,084	+ 5.33
R. I.	12,213	11,550	+ 5.74
S. C.	23,829	19,785	+20.44
S. D.	13,667	12,801	+ 6.77
Tenn.	30,496	31,065	− 1.83
Tex.	165,457	122,637	+34.92
Utah	11,325	9,717	+16.55
Vt.	7,023	6,637	+ 5.82
Va.	44,144	37,749	+16.94
Wash.	40,811	33,514	+21.77
W. Va.	23,640	20,193	+17.07
Wis.	58,612	54,219	+ 8.10
Wyo.	7,950	6,125	+29.80
Total	2,330,003	2,095,054	+11.22
Daily Av.	77,667	69,835	+11.22
Total change from previous year	+234,949		

(a) Not available at time of publication. August 1941 consumption was 43,726,000 gal.

Pennsylvania Crude Runs

(Compiled by National Petroleum Assn. from reports of all companies that refined Pennsylvania crude. Figures in barrels.)

Week Ended	Daily Average	Week Ended	Daily Average
Jan. 4	60,635	June 28	74,440
Jan. 11	71,543	July 5	71,340
Jan. 18	75,854	July 12	80,616
Jan. 25	74,429	July 19	76,155
Feb. 1	74,363	July 26	74,353
Feb. 8	75,735	Aug. 2	76,762
Feb. 15	73,712	Aug. 9	62,961
Feb. 22	71,890	Aug. 16	70,248
Mar. 1	68,969	Aug. 23	76,551
Mar. 8	65,810	Aug. 30	80,293
Mar. 15	76,617	Sept. 6	78,653
Mar. 22	73,851	Sept. 13	82,635
Mar. 29	73,592	Sept. 20	78,496
Apr. 5	75,127	Sept. 27	81,431
Apr. 12	72,045	Oct. 4	76,824
Apr. 19	76,970	Oct. 11	78,171
Apr. 26	79,147	Oct. 18	76,079
May 3	71,827	Oct. 25	80,321
May 10	72,608	Nov. 1	84,013
May 17	73,322	Nov. 8	77,041
May 24	77,003	Nov. 15	81,324
May 31	78,235	Nov. 22	80,431
June 7	67,639	Nov. 29	84,326
June 14	79,514	1940 Low	58,516
June 21	75,020	1940 High	85,584

SALES GO UP WHEN GOOD LIGHTING GOES IN

Notice how little light "spills" outside the lot at this station lighted by five Westinghouse Service Floodlights. Four 1000-watt Service Floodlights and one 500-watt Service Floodlight with incandescent bipost provide adequate illumination.

Service stations can capitalize on increased hours of darkness by adding the sales appeal that results from good lighting. With defense employment curtailing the motorists' time for necessary servicing of their cars, it is more essential now than ever before to provide adequate lighting, not only to attract patrons to your station, but to permit you to render the same standard of service as assured under daylight conditions.

Good lighting is the best salesman you can find for night business. Good lighting converts a dull, obscure station into a show window. It draws the motorist's attention to your location. Furthermore, it suggests friendly, efficient service and clean rest rooms. And because it brings in more customers, you have an opportunity to increase sales of those extra profit items—tires, accessories, batteries, etc.

But, good lighting like other good sales builders must be planned correctly. When you improve your lighting, be sure the light you pay for isn't wasted.

Westinghouse has designed special lighting equipment for service stations so the light will always be concentrated on the lot. This equipment has been standardized and is adjustable to all types of outlets. A Westinghouse lighting engineer will be glad to discuss your problem with you and show you how to get show window results at the lowest cost. Just call the nearest Westinghouse office listed in your local telephone directory.

WESTINGHOUSE ELECTRIC & MANUFACTURING CO.
EAST PITTSBURGH, PA.

The Westinghouse Service Floodlight

The new Westinghouse Service Floodlight lets you put the light where you want it. It combines two floodlights in one. You can adjust it easily for "on the spot" illumination and at the same time get general over-all illumination on the lot. Available in 500-watt units for bipost or screwbase lamps, in 750-1000-watt size for bipost lamps only, and for 400-watt, DH-1 mercury lamps.

J-94470

Westinghouse

LIGHTING EQUIPMENT

STATISTICS

Crude Oil Stocks

(Bureau of Mines Figures; Thousands of Barrels)

Grade or Origin	Nov. 15	Nov. 22	Nov. 29	Change from Nov. 22
Pennsylvania Grade	3,773	3,694	3,671	— 23
Other Appalachian	1,452	1,569	1,498	— 71
Lima-Michigan	1,237	1,298	1,233	— 65
Illinois-Indiana	18,046	18,474	18,142	—332
Arkansas	2,379	2,313	2,419	+106
Kansas	6,710	6,860	6,846	— 14
Louisiana:	12,400	12,452	12,899	+447
Northern	3,625	3,814	3,987	+173
Gulf Coast	8,775	8,638	8,912	+274
Mississippi	2,217	2,256	2,193	— 63
New Mexico	6,816	6,926	6,997	+ 71
Oklahoma	52,338	52,148	51,841	—307
Texas:	80,542	81,422	81,891	+469
East Texas	20,126	20,293	20,679	+386
West Texas	16,935	17,137	17,605	+468
Gulf Texas	23,884	24,274	23,551	—723
Other Texas	19,597	19,718	20,056	+338
Rocky Mountain	15,941	16,033	16,020	— 13
California	34,227	34,083	34,781	+698
Foreign	2,321	2,428	2,453	+ 25
Total United States refinable	240,399	241,956	242,884	+928
Heavy in California	9,951	10,162	10,092	— 70
East Coast refinery crude	12,694	13,052	12,863	—189
East Coast pipe line crude	469	424	424	...
East Coast refined products	68,041	68,341	68,747	+406
Total all oils	81,204	81,817	82,034	+217
East Coast refined stocks in bond	650	650	[1]750	+100

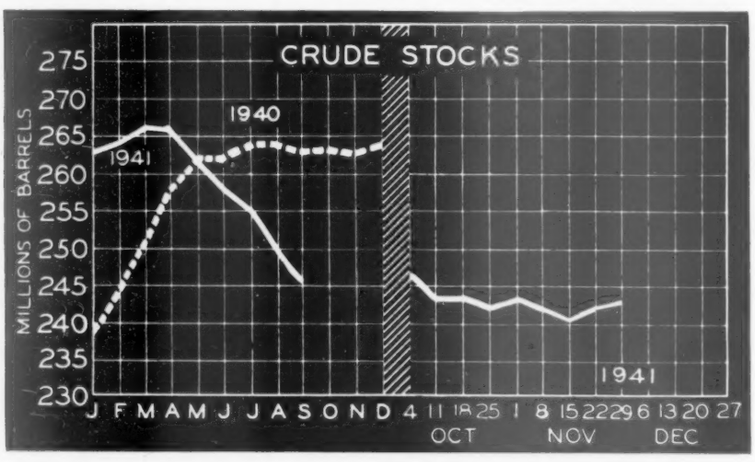
[1] Includes estimates of 100 for distillate and 650 for residual, which estimates should be added to B. of M. current totals for all oils as shown above when comparing with a year ago.

Inventories, Pennsylvania Oils Other Than Lubricating Oils

(Compiled by National Petroleum Assn. from Reports of Oil Region Refiners. Figures in barrels.)

	Inventory Oct. 31, 1941	Inventory Sept. 30, 1941	Inventory Oct. 31, 1940
1. Naphthas and Gasoline:			
(a) Straight run, unblended and or unleaded, for sale as motor fuel	42,550	43,141	10,954
(b) Naphtha and gasoline, for sale for blending or further refining, or held at refinery for further distillation, reforming, blending or leading	165,454	165,560	165,851
(c) Below 65 octane, not included in (a) or (b) above	5,018	3,351	4,840
(d) 65 octane and above	270,444	270,032	214,804
2. Salable naphthas other than motor fuel material (does not include refinery Process Naphthas)	19,086	16,250	24,527
3. Kerosine	156,611	127,790	90,956
4. 36-40 gas oil (includes furnace oil)	142,135	123,360	75,614
5. Fuel Oil (not reported above)	31,479	34,237	28,607
6. Oils held as cracking plant charging stocks	257,625	266,534	277,408
7. Non-viscous neutral	20,516	21,365	21,164
8. Wax distillate	113,632	103,708	87,366
9. Crude Petrolatum	19,821	20,426	13,321
10. Wax (lbs.)	3,969,347	4,600,055	3,371,464

Monthly figures are actual as reported by Bureau of Mines. Weekly figures are as estimated by American Petroleum Institute on Bureau of Mines basis, except crude stocks which are as reported by Bureau of Mines. Weekly stocks figures beginning Aug. 16, 1941 and monthly stocks figures beginning July, 1941 do not include shuttle or lease lend material formerly reported as part of inventories.



Refinery operations graphs and tables appear in news section

NPN's Washington Directory Of Oil Agency Headquarters

Following is a partial list and directory of governmental agencies in Washington dealing with matters affecting the oil industry: (List is as accurate as possible but is only tentative, as changes are constantly occurring in room and phone numbers)

Petroleum Co-ordinator—Harold L. Ickes
Interior Department (New Building), 18th and C Streets, N. W., Room 6156, Extension 500

Deputy Petroleum Co-ordinator—Ralph K. Davies
New Interior Building, Room 6654, Extension 3831-2

Interior Department Phone Number—Republic 1820

Petroleum Co-ordinator's Staff
6th and 7th Floors, New Interior Building

Special Assistants—
George W. Holland, Room 7312, Extension 643
Gordon M. Sessions, Room 6620, Extension 3844
J. Elmer Thomas, Room 6420 Extension 4735

Director of Production—
Robert E. Allen, Room 6647, Extension 3334

Director of Refining—
Wright W. Gary, Room 6637, Extension 3233

Director of Transportation—
H. A. Gilbert, Room 6629, Extension 4418

Director of Marketing—
John W. Frey, Room 6623, Extension 4646

Director of Research—
Edward B. Swanson, Room 7313, Extension 649

Director of Conservation—
Everett Lee De Golyer, Room 6418, Extension 4459

Chief Counsel—
J. Howard Marshall, Room 6649, Extension 4100

OPM Priority Consultant—
James E. Hughes, Room 7416, Extension 4616

Executive Officer—
Stanley W. Crosthwait, Room 6515, Extension 4363

Special Liaison Agent Between OPC and OPM—
Joseph H. Ellender, Room 6525, Extension 4635

Director of Information—
Herbert A. Yocom, Room 6620, Extension 3844

On Special Assignment to Information Division—
Walton Onslow, Room 6622, Extension 3844

Foreign Division—
W. D. Crampton, Room 7525, Extension 4788

Petroleum Receptionist—
Mrs. Rosalie E. Reid, Room 6635, Extension 3429

Oil Section, Office of Production Management—
New Social Security Building, Room 4613. **Dr. Walter Whitman,** petroleum consultant for OPM, Phone number Republic 7500, Extension 476, 477 and 478. Assistant, **C. C. Monrad**

Office of Price Administration—
4th and Independence Avenue, Temporary Building D, Republic 5050. **Dr. J. K. Galbraith,** assistant administrator in charge of price division, Extension 673; **George Doffing,** price executive of fuel section, Extension 684

U. S. Maritime Commission—
M. W. Bowen, tankers, Commerce Department, Room 4319. Capitol's Phone Number—NAtional 3120

Congressional Oil Investigating Committee—
Rep. Wm. J. Cole, Jr., Chairman, New House Office Building, Room 1535, Extension 699

Senatorial Oil Shortage Investigating Committee
Senator Francis Maloney, chairman, Senate Office Building, Room 354, NAtional 3120, Extension 1196

They talk about the weather—24 hours a day!

A PILOT can't *do* much about the weather — so the next best thing is to *know* it. Feeding him facts before and during flights is the duty of the Civil Aeronautics Administration's nation-wide system of "weather-watchers"— observers and forecasters who "talk about the weather" 24 hours a day. And the safety of every flier depends upon what they say.

Although scattered across the whole United States, they are in constant contact with one another through the help of a far-flung teletypewriter network. *In seconds*, they can exchange detailed typewritten weather reports, work out forecasts and keep military and commercial airports up-to-the-very-minute on weather conditions.

Designed to handle America's peace-time messages accurately and without delay, Bell System Teletypewriter Service's value increases in the nation's emergency.

BELL SYSTEM TELETYPEWRITER SERVICE

South Carolina Jobber President Marks 21st Anniversary in Oil

War finds an ex-Navy man at the head of South Carolina Oil Jobbers Assn. He is Spencer Rice McMaster, Winnsboro, S. C., who next year celebrates his 21st anniversary in the oil business.

Born in Winnsboro, Mr. McMaster began his business career as a Ford dealer. He became interested in the oil business in 1921 and organized the Winnsboro Petroleum Co. Later, he added the Fairfield Oil Co. to distribute another brand in the same territory.

Mr. McMaster was educated at Winnsboro High School and received his college degree from Randolph-Macon College in Virginia.

He is a member of the District 1 marketing subcommittee; director of the Citizens and Southern Bank of South Carolina; director of the Merchants and Planters Bank of Winnsboro; and vice-president of Organized Business, Inc., of South Carolina.

During the first war, Mr. McMaster served as an ensign in the Navy; was a member of Kappa Sigma fraternity in college and is now a Mason. He claims to possess "all the bad habits of man", but his particular hobbies are raising a herd of a mere two-hundred head of Herford cattle, golfing, fishing and quail shooting.

Spencer R. McMaster

NATIONAL PETROLEUM NEWS

VOLUME 33 WEDNESDAY, DECEMBER 10, 1941 NUMBER 50

A-8 Priorities Given by OPM To Assist Oil

BULLETIN

WASHINGTON—OPM is preparing to requisition war materials where needed. President Roosevelt announces civilian use of all metals will be cut 50% in 1942.

NPN News Bureau

WASHINGTON, Dec. 9— Allocation system will replace priorities next year, with each industry being allotted a certain tonnage of steel and other critical materials, but there still will be some sort of preference ratings among members of an industry contending for a share of the allotted tonnage.

War's outbreak has further confused priorities situation. But here was the general plan up to the time that Japanese planes bombed Hawaii:

Each industry will be allotted a definite percentage of its 1942 requirements. Out of that percentage must come defense needs. What's left will be rationed for essential civilian requirements.

Allocations system, while tightening up on distribution of critical materials and equip-

(*Continued on Page* 13)

BULLETINS

OPM ON 'LEAD'

WASHINGTON — Problem of chlorine and ethyl alcohol supplies for making tetraethyl lead may be worked out satisfactorily but there would still be the pig lead problem, OPM representatives told "lead" conference late today.

However, OPM will consider oil industry's proposal for increasing pig lead output which will be presented in detail to OPM by a committee to be named by Deputy Co-ordinator Davies.

Meanwhile, OPM will be asked to put off for 60 days the present "lead" rationing plans while refiners adjust their operations to meet the situation.

* * *

DEALERS PROTEST

NEW YORK—Executive committee of Eastern States Gasoline Dealers Conference adopted resolution stating: "That a protest be made forthwith to Co-ordinator Ickes, protesting against the omission of retailers or retailer representation from the Petroleum Industry Council, and that the executive committee views with re-

(*Continued on Page* 13)

District Advisory Groups Meet With OPM on 'Lead'

By Teletype
NPN News Bureau

WASHINGTON, Dec. 9.—Increased production of pig lead is the answer to the tetraethyl lead situation—even if it requires an advance of a cent or several cents in pig lead prices, according to the unanimous opinion of refining and marketing district chairmen who are meeting today with Office of Production Management.

So far, Price Administrator Henderson has opposed any move to raise pig lead prices, contending that present price levels are adequate to encourage increased output. "Pegged" prices are 5.85c (New York) per lb., which is higher than 1940 but below 1937's average of 6.01c.

Ethyl has indicated a willingness to pay higher prices from "marginal" mines and there has been some talk of buying the mines and operating them.

Bigger 'Lead' Cut Looms

OPM has curtailed Ethyl Gasoline Corp.'s raw material supplies to point where Ethyl has had to ration refiners' tetraethyl lead supplies to 70% of previous year's requirements, beginning Jan. 1. And, even before outbreak of war, OPM had indicated this might be cut even further.

Increased costs to motorists (*see p.* 14) and strain which would be put upon production and refining branches—due to increased fuel consumption with lower octane gasoline—were cited.

Should all other proposals fail, then committee representatives may ask that "lead" rationing be postponed for 60 days or until an "equitable" allocation plan can be worked out and also so that refiners can adjust themselves to reduced supplies of this anti-knock fluid.

Oppose Government Grading

A substantial number of industry representatives present were opposed to a government-fixed octane rating.

To free base stocks for aviation gasolines of 91 or 100-octane, OPC has recommended to petroleum industry that for "all grades of gasoline used for aviation purposes having an octane number of 85.0 or less, as determined by the 1-C aviation method", that they "shall be produced by the addition of tetraethyl lead to clear gasoline having an octane number not greater than 67.0 as determined by the 1-C aviation method".

* * *

'Lead' Allocation Draws Criticism

NPN News Bureau

NEW YORK, Dec. 8.—Allocation of sufficient pig lead and chlorine for manufacture of tetraethyl lead to maintain gasoline supply for the motoring public at present high-quality level is urged in joint resolution passed by District 1 refining and marketing committees, John A. Brown, Socony-Vacuum president and District 1 general chairman, said today.

Opposing Office of Production Management proposal for a sharp reduction in lead use, the resolution states that "no question of the inadequacy of the supply of any one of these materials (pig lead and chlorine) for direct defense requirements has appeared. The question is solely one of relative economic gain or loss through diversion of these raw materials from tetraethyl lead man-

Petroleum Defense Council Meets for First Time

"Remarkable coincidence of history" (see p. 11). In the Pacific, Jap bombers rained explosives on U. S. possessions; in Washington, Petroleum Industry Council for National Defense met for first time to further push oil's all-out war effort

ufacture to other channels of civilian consumption."

Larger public consumption of a less efficient grade of motor fuel, increasing the public's yearly fuel bill by "at least $125,000,000" would be made necessary by restriction of tetraethyl lead production, the resolution states.

* * *

District 2 Urges 2-Month Reprieve

NPN News Bureau

CHICAGO, Dec. 6.—District 2 refining committee, in breakfast-to-midnight meeting here this week, drew up a recommendation asking relief for the oil industry from the present allocation of tetraethyl lead for the next 60 days, according to Paul Blazer, Ashland, Ky., president of Ashland Oil & Refining Co. and chairman of the District 2 refining committee.

This would be accomplished, according to Mr. Blazer, by permitting Ethyl Gasoline Corp. to obtain enough raw materials to preclude restrictions on its sales during the coming 2-month period. Meanwhile, the committee would like to study the matter further, citing "serious dislocations" caused by the present allocation system.

Chairman Blazer indicated that an alternative recommendation was drawn up at the meeting for submission to the Office of Petroleum Co-ordinator, in the event the 2-month reprieve is not granted, but nature of the second recommendation was not disclosed. Full committee report has not been released.

* * *

'Lead' Pool Asked By District No. 3

Special to NPN

HOUSTON, Dec. 6.—Thirty-five members of District 3 refining and marketing committees, in session this week at Beaumont, Tex., drew up a recommendation for presentation to Washington, asking:

1—That whatever amount of tetraethyl lead is set up for District 3, it should be allocated to refiners on the basis of the percentage of each refiner during the last 6 months;

2—That a pool be set up for District 3 to take care of distribution inequalities;

3—That distribution inequalities be worked out by district subcommittees and the refiner who has not received his proper share be given it from the pool.

Reduction in octane ratings was discussed but no formal recommendation was drawn up. General trend of this discussion favored least possible changes.

District 4 Plans: Peg Octanes, Ban 'Lead' in 3rd-Grade

Special to NPN

SALT LAKE CITY, Dec. 6.—Recommendations of District 4 refining and marketing committees, carried to Washington this week by Refining Committee Chairman Henry D. Moyle, vice-president of Wasatch Oil Refining Co., would peg "house-brand" at 70 octane; premium at 76-78 octane; and eliminate use of lead in third-grade entirely. These recommendations were made at a Denver, Colo., meeting of the committees Dec. 5.

Chairman Moyle, a strong believer that higher prices for pig lead would eliminate the necessity for tetraethyl lead curtailment, is a graduate mining engineer and a leader in western mining circles in addition to his oil industry affiliations. He told the joint OPC-OPM meeting with Ethyl Gasoline Corp. in Washington Nov. 25-26 that a price of 10c per lb. for pig lead would "cure the shortage", Ken W. Yeates, general manager of Wasatch, revealed today.

Court Upholds Texas Formula

Special to NPN

AUSTIN, Dec. 8.—The Texas Railroad Commission's "yardstick formula" for prorating the state's oil production has been upheld for the first time in a decision handed down by the Court of Civil Appeals at Beaumont in a case which threatened to wreck the whole proration policy.

The case in question, which was a clear-cut test of the commission's policy, was brought by the Continental Oil Co. in connection with the Conoco-Driscoll field in Duval county.

Continental had attacked the Commission's proration order on the grounds that the field had a market for more crude than the state allowed it to produce. Continental claimed that the railroad commission had the power to prorate only to prevent physical waste, and that since there was a market for the oil there would be no physical waste. Thus the commission, according to Continental, overstepped its authority.

A district court in Austin upheld Continental and issued a restraining order against the commission from enforcing its order. The state appealed, and the Beaumont court reversed the lower court.

Continental is expected to appeal the court's decision.

Price is Held Only Factor Against More Lead Output

Special to NPN

SALT LAKE CITY, Dec. 6.—Nature and the mining industry can "come through" with sufficient lead metal for needed tetraethyl lead supplies if the government will co-operate, western mining leaders declared here today.

"Let OPA raise the price ceiling," was the general cry, with specified modifications.

"Lead production can be increased sufficiently without running into the problem of more steel," A. G. Mackenzie, secretary of the Utah Chapter of the American Mining Congress, said, explaining: "Men, timber, and some explosives are the principal essentials—after the government decides it wants more lead."

Now at Peak Output

"Mining industry is producing all the lead possible under the present circumstances," he said, "but much more is possible with a few arbitrary decisions of the government."

Utah, Idaho and Missouri are the principal lead producers. Missouri, after the St. Joseph Lead Co. recently went on a six-day week, will probably not be able to expand production at this time as much as Idaho and Utah, Mr. Mackenzie said, inasmuch as the Missouri mine is probably increasing production already with the certainty that conditions will require the government to raise lead prices.

"Lead production can be increased an almost immediate 20%," declared George W. Snyder, vice-president in charge of production of Snyder Mines, Inc., probably the largest independent lead producer west of the Mississippi.

Gives 4-Point Plan

"Twenty per cent increase can be effected," Snyder said, "if the following four point program is carried out:

"1—Lead, zinc and copper should be placed in the same category as manganese (before the last government ruling), and thus exempted from the excess profit tax.

"2—Government assistance for capital expenditures.

"3—Increase lead prices 2c for a specified time to allow a 'safe' period for operations, a minimum of 3 years.

"4—Strike legislation."

The consensus of the industry is that additional lead must come from low grade ores in already existing mines, which would be the quickest and probably largest source, and from the marginal mines that wait the higher prices for opening.

★ ★ ★

Lead Ore Output Can Be Stepped Up If Prices Rise, Colorado Miners Say

Special to NPN

DENVER, Dec. 8.—A guarantee of at least 7c a pound for lead through 1944 or 1945 is necessary, according to mining men, to step up Colorado lead production to the war program level of double the present output. Profit margin at present prices, mining men say, is too narrow to make this likely.

Oil men are vitally interested in the lead situation because of its need in making tetraethyl lead for gasoline. Quick action at Washington assuring higher lead metal prices might avert tetraethyl lead curtailment, it is believed.

Colorado lead production increased from 16,444,000 lbs. in 1939 to 22,952,000 lbs. in 1940, due primarily to the higher price paid for zinc, produced along with the lead. The 1940 zinc output went up to 10,120,000 lbs. from 3,660,000 lbs. in 1939.

The matter of increasing the output of these key metals is being studied by state and federal agencies. The Colorado Metal Mining Fund, through Gov. Ralph L. Carr, head of the fund and the State Defense Council, has asked lead miners to indicate the bottom price needed to insure greater production. The minimum suggested is the 7c figure mentioned above.

Opening of such mines as the U. S. Smelting Co.'s Sunnyside at Silverton would follow quickly, it is stated, if this price were assured for the next several years. The American Smelting & Refining Co. would re-open its Durango smelter in this event. Higher fixed prices should stimulate production at Leadville, Rico, and other former heavy lead boom camps.

During the first World War, lead went from around 4.75c per lb. to 12.5c. Zinc went to 27c. Present prices are around 5 9/10c for lead; 8.25c for zinc.

NPN Reports from

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Ickes Promises Oil Council 'Free Hand' in its Affairs

War's declaration finds representatives of the petroleum industry meeting with government officials to plan closer co-operation for national defense and to adjust industry's operations to meet scarcities of materials.

Over-all co-operating agency is the newly-formed Petroleum Industry Council for National Defense, composed of 66 oil leaders and executives of major companies and associations, major and independent—which is headed by W. R. Boyd, Jr., president of the American Petroleum Institute.

"This organization," said Co-ordinator Ickes at council's first meeting Dec. 8, "was set up because we have felt here the need for counsel in petroleum matters—a council which can advise us as to the over-all, national view of the industry."

Mr. Ickes told the council it was "at perfect liberty to raise and discuss and advise us on any matter that may occur to you. And we would like from time to time to submit to you questions for your consideration and advice."

More Oil Meetings To Plan War Needs

Council discussed question of obtaining anti-trust clearance from Justice Department for its co-operative activities, naming committee to look into matter, consisting of: A. L. Weil, Los Angeles; W. F. Humphrey, San Francisco (Tide Water Associated), and W. T. Holliday, Cleveland (Ohio Standard).

Tetraethyl lead situation was discussed briefly at the council meeting, with many of its members remaining over for the "lead" meeting on Dec. 9 with Office of Production Management and the co-ordinator's staff.

Another meeting Dec. 9 was that of district marketing equipment subcommittee chairmen to discuss amount of equipment on hand, the amount usually manufactured in a typical year—such as 1939 or 1940—and plans for forecasting 1942 needs. Group present included: C. C. Benedict, New York, Socony-Vacuum, representing District 1; William H. Tell, Chicago, Indiana Standard, District 2; Dan O'Connell, Houston, Texaco, District 3; John Lang, Salt Lake City, Lang Company, District 4; and B. Devere, Los Angeles, Pathfinder Petroleum Co., District 5.

Meeting Dec. 10, the district committee chairmen and other marketing representatives will hear George Doffing, OPA'S oil price executive, discuss the Nov. 7 "freeze" of all oil prices. There is also a meeting Dec. 10 of company executives on plans for increasing 100-octane aviation gasoline.

At the petroleum council meeting Dec. 8 oil company executives vied with one another in their insistence that production of this warplane fuel be stepped up immediately. It was one of the things which, Mr. Ickes said, "we have got to produce and produce faster than was ever thought possible before."

Council's Aims Told

Idea of an overall petroleum council was not an "afterthought" to setting up the district committees, Mr. Ickes told the council at its first meeting. From the beginning, there has been the idea of a national advisory group, with "adequate and fair and justly proportionate representation" for all elements in the industry, independent and majors, he added.

"There is a very real job ahead of you," he told the council as it met in the tense hours just preceding Congress' declaration of war on Japan.

"More than ever we want you to co-operate with us and more than ever I am grateful that we got off to the good start that we did, so far as our personal relationship is concerned. By that I mean the relationship between the government and the industry.

"I think that we have learned to appreciate each other, to know each other and have learned to work together. And I, for one, hope that we will go forward in that spirit, and I have not the slightest doubt that we will."

Oil's Biggest Job Still Lies Ahead

Mr. Ickes praised the industry highly for the "magnificent job" it has done so far in national defense preparations. He called upon the Council to co-operate with the government and see that "every barrel of oil that is needed in any part of the world for defense of America is produced and delivered when it is needed".

Responding, John A. Brown, New York, Socony-Vacuum president and District 1 general chairman, told Mr. Ickes:

"Acting as chairman of District No. 1 since this organization was started, I think we have all felt a feeling of great confidence in the Co-ordinator's leadership, with Mr. Davies and his staff here. It is perhaps one of those remarkable coincidences of history that this National Council is called and meets here for the first time on this particular morning. I know that the oil industry and the individuals in it are not surpassed by any in their patriotism and devotion, and that they will give you all of counsel and assistance and advice and under your leadership I think that the oil industry in this war will make a record that we will all be fairly proud of."

Mr. Boyd, A.P.I. president then said:

"May I express to you and the Deputy Co-ordinator my sincere appreciation for the formation of this instrumentality for co-

26-Man Executive Committee Elected By Defense Council; Boyd Named Head

President W. R. Boyd, Jr., of American Petroleum Institute was unanimously elected chairman of the Petroleum Industry Council for National Defense and of the 26-man executive committee at the council's first meeting in Washington Dec. 8. Members of executive committee follow:

W. R. Boyd, Jr., President, American Petroleum Institute, New York, N. Y.

John A. Brown, President, Socony-Vacuum Oil Co., New York, N. Y.

Frank Buttram, President, Independent Petroleum Assn. of America, Oklahoma City, Okla.

H. D. Collier, President, Standard Oil Co., (California), San Francisco, Calif.

O. D. Donnell, President, Ohio Oil Co., Findlay, Ohio.

J. Frank Drake, President, Gulf Oil Corp., Pittsburgh, Pa.

W. S. Farish, President, Standard Oil Co. (New Jersey), New York, N. Y.

W. H. Ferguson, Executive Vice President, Continental Oil Co., Denver, Colo.

George A. Hill, Houston Oil Co., Houston, Tex.

W. F. Humphrey, President, Tide Water Associated Oil Co., San Francisco, Calif.

J. C. Hunter, President, Mid-Continent Oil and Gas Assn., Tulsa, Okla.

W. A. Jones, President, Cities Service Co., New York, N. Y.

B. L. Majewski, Vice President, Deep Rock Oil Co., Chicago, Ill.

Henry D. Moyle, Vice President, Wasatch Oil and Refining Co., Salt Lake City, Utah.

I. A. O'Shaughnessy, President, Globe Oil & Refining Co., Wichita, Kans.

J. R. Parten, Chairman, Premier Oil Refining Co., Houston, Tex.

J. Howard Pew, President, Sun Oil Co., Philadelphia, Pa.

Frank Phillips, Chairman of the Board, Phillips Petroleum Corp., Bartlesville, Okla.

E. E. Pyles, Vice President, Hancock Oil Co., Long Beach, Calif.

W. S. S. Rodgers, President, The Texas Co., New York, N. Y.

Charles F. Roeser, Roeser and Pendleton, Fort Worth, Tex.

E. G. Seubert, President, Standard Oil Co. (Indiana), Chicago, Ill.

H. F. Sinclair, Chairman, Consolidated Oil Corp., New York, N. Y.

Lawrence Vander Leck, President, Oil Producers' Agency, Los Angeles, Calif.

R. van der Woude, President, Shell Union Oil Corp., New York, N. Y.

A. L. Weil, Los Angeles, Calif.

operation. I agree with Mr. Brown that this is a very fortunate thing that we are meeting here today. I think that perhaps this type of co-operative organization may well serve as an object lesson to some other agencies of the government in their relationships with industry. I hope that this council and the members of it may develop the industrial statesmanship essential to 100% co-operation with you and Mr. Davies, and your organization, to perform a great job and service."

Deputy Co-ordinator Davies, after Mr. Ickes had spoken and withdrawn from the meeting, outined in further detail how the Council was to function as a national advisory agency, with district organizations still handling regional matters. Mr. Davies declined to act as temporary chairman, saying that the Council was entirely an industry group.

Council chairman Boyd as well as the 26-man executive committee (*see p.* 11) was nominated by a committee, headed by J. L. Hamon, Dallas producer, consisting of Mr. Brown, Mr. Colley and C. S. Jones.

Council authorized Chairman Boyd to employ a full-time secretary. Council will also open Washington offices. J. S. "Doc" Cook, Mr. Boyd's assistant at the A.P.I. acted as temporary secretary at first Council meeting.

Two of the 66 oil men invited to membership on the Council (*NPN Dec. 3, p.* 17) did not accept. They were D. J. Moran, Ponca City, Okla., president of the Continental Oil Co., and Will J. Reid, Long Beach, Calif., president of Hancock Oil Co. In their places, were named Parker L. Melvin, Bradford, Pa., president of Pennsylvania Grade Crude Oil Assn. and Ralph Lloyd, Los Angeles, of California Oil and Gas Assn.

Council meets first Tuesday of each month — next meeting will be Jan. 6.

Executive committee will meet at such time and places as it chooses.

Weymouth Joins OPC

Thomas R. Weymouth, retired vice-president of Columbia Gas & Electric Corp. of New York, has been appointed consultant on natural gas in Office of Petroleum Co-ordinator, OPC said this week. Mr. Weymouth has had 38 years experience in natural gas business. He will be attached to natural gas and natural gasoline section, which is headed by Paul M. Raigorodsky.

OPA Sets Asphalt Prices At January 1, 1941 Level

Asphalt prices, both contract and open market, will be no higher in 1942 than they were on Jan. 1, 1941, if asphalt manufacturers comply with Price Administrator Henderson's latest "request".

This "request", made by Mr. Henderson on Dec. 6, bears out the statement he made Nov. 28 in a letter clarifying his previous overall oil price-fixing "request" (dated Nov. 7).

In this letter, Nov. 28, the price chief had indicated Nov. 7 prices were not sacred. In other words, OPA might ask that prices on some products be frozen at levels *lower* than those existing Nov. 7.

Letter Quoted

"It is to be understood," Mr. Henderson had said, "that this does not mean the prices of petroleum and petroleum products which prevailed November 7 have received the approval of this office." Apparently, Nov. 7 asphalt prices did not meet with OPA's approval.

Late last week, OPA reported:

"The letter embodying these requests is (on asphalt prices) now being prepared and will be sent out shortly to more than a hundred manufacturers."

Explaining this price "request", OPA stated:

"During the past year open market prices have increased substantially throughout the entire country. Prices of asphalt vary widely, depending upon the distance from fields where asphaltic base crude oil is found. Along the Eastern seaboard the open market prices on one principal grade of asphalt rose during 1941 from around $13 a ton for major grades to as much as $15 and there have been requests received by OPA for additional increases."

Auto Use Tax Blocked

Collection of the new $5 "use" tax on automobiles, trucks and busses was effectively blocked last week when the House Appropriations Committee, taking the cue from its subcommittee, knocked a $4,502,554 item out of a supplemental defense appropriation bill for collection of the tax by Internal Revenue Bureau.

Petroleum Industry Council for National Defense Meets with Ickes

A-8 Priority Given To Aid Oil Industry

(Continued from Page 9)

ment, is intended also to make it easier for those entitled to these supplies to obtain them. Principal value is that a definite quantity will be set aside, in contrast with present priorities system which has tendency to issue a lot of paper ratings for more material than is actually available.

A new basic plan, the "production requirements plan," utilizing Form PD-25A has been issued which enables manufacturers to obtain necessary raw materials by budgeting their requirements over each calendar quarter. Superseding old "defense supplies rating plan," new plan will extend limited blanket rating to manufacturers to obtain their raw materials for each 3 month period.

In another order, supply houses and equipment manufacturers supplying the oil industry were given a blanket rating of A-8 to obtain specified quantities of materials in an order which classified material needs of the oil industry as "defense requirements."

A-8 rating applies to materials and equipment manufactured for the oil industry, including that for bulk plants and service stations.

But all four branches of the industry itself will still need preference ratings to buy the materials and equipment carried by supply houses. However, supplemental orders, reportedly extending blanket rating to all branches of the industry, are forthcoming.

These supplemental orders will probably give different preference ratings to the same equipment, when used for different purposes. Thus, a valve used by a wildcat producer might get a different rating than the same valve for use in refining or marketing. And defense authorities will insist that each piece of equipment must be used for its own specified purpose.

With defense demands accelerated by actual war needs, tonnage available for civilian purposes will be so greatly reduced, according to some observers, that new installations will be restricted and most equipment and materials will go for replacements and maintenance. Of course, if a new installation is needed for defense, it will get preference.

Oil industry's 1942 steel requirements, according to one set of figures circulating among defense agencies, will be: nickel steel, 80,000 tons; plate steel, 512,000 tons; tubular steel, 2,500,000 tons; and other types, mostly sheets and bars, about 2,200,000 tons.

Roughly, these requirements broken down by branches of the industry, are as follows: marketing, 180,000 tons; transportation, 1,300,000 tons; refining, 600,000 tons; and production, about 3,200,000 tons.

If these totals are reduced, first to be curtailed probably will be nickel and plate steel. There has been some talk that OPM would like to cut these two types about 40% below the above figures.

U. S. Maritime Commission On War-Time Footing

War-time secrecy was imposed on movement of all merchant ships, including tankers, last week by the Maritime Commission when Admiral Emory S. Land, chairman, issued a general memorandum to the press, radio and other disseminators of information, asking their co-operation.

He said the Commission had adopted a war-time policy and immediately requested "all agencies of public information" to refrain from publishing any information whatsoever, including photographs, which would give away details concerning movement, position, cargoes or destination of any merchant vessels "in any waters."

Sohio Completes Aviation Unit

Operation of a new aviation gasoline unit at its Toledo, Ohio, refinery has been started, Ohio Standard announced this week. Above are fractionating towers, 125-ft. high, at the Toledo plant. Construction on the new unit began last June; sulphuric acid alkylation process is used. Company says this is first plant completed since Petroleum Co-ordinator Ickes called for greatly increased 100-octane gasoline production last August

BULLETINS

(Continued from Page 9)

gret and apprehension this further instance of the studied ignoring of retailers by the Oil Co-ordinator's Office."

* * *

TRUCKS AND WAR

WASHINGTON — With troops, war supplies and other rush orders of a nation at war taking priority on rail transportation, oil truckers throughout the U. S. are mobilizing here and elsewhere to map campaign of unified action to bolster defense transportation.

Truckers who have not been operating their equipment 24 hours a day, may do so, as well as press other equipment, now idle, into immediate use. Trucks undoubtedly will begin to haul more oil.

Meantime, a subcommittee of the Senate Interstate Commerce Committee started hearings this week on a bill empowering ICC to modify state regulations on trucks, upon complaint of anyone affected, if necessary.

IRB Still Studying Tax on Drilling

An indication that the Internal Revenue Bureau is not altogether sure it should change the method of making income tax allowances for intangible drilling expenses was seen last week after Sen. Tom Connally, Dem., Tex., called on the Bureau to state its position clearly —"without delay".

Would Hit Contractors

Under present system, producers are allowed to deduct for income tax purposes legitimate expenses incurred in drilling a well — regardless of whether they drill the well themselves or have it done under contract.

In October, IRB issued its confidential memorandum, saying that henceforth deductions could be made only if drilling was done by the company itself.

Memorandum was withdrawn and held in abeyance when industry protested vigorously.

Sen. Connally had Dale Miller, Washington representative of the Dallas Chamber of Commerce and Colin F. Stam, Congress' legal expert of Joint Committee on Internal Revenue Taxation, investigate the problem. They reported: Proposed ruling would prove "harsh and inequitable."

Metal Container Curb Plans To be Discussed December 15

War with Japan is expected to have a direct effect on current metal container shortage and is scheduled to come up for discussion Dec. 15 when chairmen of the five district temporary container subcommittees meet here with officials in Office of Petroleum Co-ordinator.

In a supplement to Recommendation No. 14 (*NPN Nov. 5, p. 5*), OPC asked the 5 district container subcommittees to prepare plans for submission to OPC at the Dec. 15 meeting on the following topics, presented here in brief:

Conservation of containers: Aims to keep containers in use as long as possible, with plans for re-use in all branches of industry. Would eliminate any present inefficiency.

Standardization of containers: Elimination of odd-sized containers with plans to use larger containers wherever possible and to study specifications already prescribed by federal government.

Substitution of containers made of materials other than metal: In so far as efficiency dictates, plans are to be submitted for containers made of wood, paper, glass and other materials not in as much demand as metals. Grades of sheet steel not in such great demand are to be studied for such metal containers as are absolutely necessary.

Wooden barrels for export: To preserve a minimum use of steel containers by oil industry, so as not to entirely lose use of steel containers, substitution of wooden barrels for export is to be studied.

Effectuating plans: With approval of OPC's chief counsel at direction of Petroleum Co-ordinator, such plans as are deemed essential, shall be carried into effect.

Survey of industry requirements: Survey called for on minimum requirements for metal oil containers over such periods of time which subcommittees will later determine.

Costs survey: To inform Office of Price Administration on what effect substitution will have on marketing, details on increased or decreased costs are to be supplied.

Meetings: To assist and encourage marketing branches of the industry to make the most widespread and efficient use of substitute and standardized containers, meetings are to be held whenever necessary, either with OPC, Office of Production Management or any other Federal agency studying the container problem.

This supplement to Recommendation No. 14 was signed by Acting Petroleum Co-ordinator R. K. Davies and was approved by Anti-Trust Chief Thurman Arnold.

Chairmen of the temporary container subcommittees are: District 1 — Lloyd Lochridge, New York, Sinclair; District 2 —L. C. Welch, Chicago, Indiana Standard; District 3—C. B. Prescott, New Orleans, Gulf; District 5—J. M. Evans, San Francisco, Tide Water.

Gasoline Stocks Up On East Coast

East Coast gasoline stocks were up 2,026,000 bbls. for week ending Nov. 29, as compared with same week last year, Office of Petroleum Co-ordinator reported last week.

Heavy fuel oil stocks, OPC said, were 27,000 bbls. over same week last year, light fuel oils were up 5,610,000 bbls., while crude oil inventories were under 627,000 bbls.

Following table shows condition of East Coast oil stocks compared with last year:

(Figures in barrels, 000 omitted)

	Nov. 30, 1940	Nov. 29, 1941	Difference
Crude oil	13,490	12,863	— 627
Gasoline	17,409	19,435	+2,026
Light heating oils	16,482	22,092	+5,610
Heavy fuel oils	12,512	12,539	+ 27
Totals	59,893	66,929	+7,036

Crude Cost Study Launched By U. S. Tariff Commission

Reconnaissance completed, the U. S. Tariff Commission is due this week to fire the first barrage of 10,000 to 12,000 questionnaires at the oil industry in the most comprehensive survey of crude production costs ever attempted.

About 5000 questionnaires were scheduled to be in the mails by Dec. 10, and a force of 15 accountants and 3 engineers are due in the field by Dec. 15 to help oil men fill out the forms.

Making the survey at the request of Office of Price Administration, the Tariff Commission is directing the questionnaires at 95% of the oil producers in the entire country; expects to have them back by Jan. 31; hopes to have preliminary figures compiled by end of March.

Covering operations in 1939, 1940 and first 9 months of 1941, the questionnaires are designed to bring out figures on costs, income, investments, and engineering data.

To Be Used by OPA

The information developed is to be used by OPA in establishing price schedules. Although data on individual companies will remain confidential, general results of the survey will be made public.

Preparations for the survey have been made during the last 3 or 4 weeks. The Stripper Well Assn., Independent Petroleum Assn. of America, Pennsylvania Grade Crude Oil Assn., and members of the Accounting Committee at the A. P. I. convention in San Francisco were consulted. The study is directed by Kenneth Stone, an expert on extraction industries.

The questionnaire, similar to the one used by the Petroleum Administrative Board back in the Code days, is a 4-page affair.

Questionnaire Contents

The first page consists of instructions. The second page contains a corporate profit and loss statement, and an analysis of general overhead and administrative expenses.

The third page consists of an income and expense statement, production figures, and engineering and well data. Page 4 shows the capital "Employed as of end of year," and an analysis of operating cost. There is room at the bottom of page 4 for any remarks the operator cares to make.

Answering the questionnaire is entirely voluntary on the part of those who receive them. Distribution of the form is not restricted to operators of any particular size. Mr. Stone is confident the industry will comply virtually 100%.

U. S. Split into 5 Areas

To aid field operations, the country has been divided into 5 general areas. That section east of the Mississippi has been split into 2 areas—the Appalachian district and "all others." Roughly the Mid-Continent area includes such producing states as Kansas, Oklahoma, North Texas; Gulf Coast area includes Mississippi, Louisiana and the rest of Texas; and the fifth district embraces California and the Rocky Mountain area.

Field headquarters have not been selected yet, but tentative plans call for one at Bradford, Pa., others in Tulsa and Houston.

British Oil 'Specs' Revised Again

Latest revision of British specifications for gasoline, kerosine, gas, diesel and fuel oils, as well as crude and sodium naphtha sulphonate, were issued Dec. 5 by British Petroleum Mission.

In a letter to NPN, D. V. Class, chief statistical officer states: "You will notice that the specifications include three for various types of crude oil and one for sodium naphtha sulphonate. The specifications for crude may have to be amended again in the near future, but at the moment they are still valid."

Copies of these specifications have been mailed to companies supplying British with petroleum. Any company not receiving them may write to British Petroleum Mission, McGill Bldg., 903 G St., Washington, D. C. They will be sent without cost.

Ben Franklin Adjusts Crude Price Postings

NPN News Bureau

TULSA, Dec. 8.—Ben Franklin Refining Co. today announced an upward adjustment in its price schedule for crude purchased in Carter and Jefferson Counties (southern Oklahoma), retroactive to Dec. 5.

New schedule begins with 75c for below 21 gravity and increases 3c for each degree of gravity to $1.05 for 30-30.9; beginning with $1.05 for 30 gravity oil, schedule increases 2c per gravity degree to $1.25 for 40 and above.

New schedules represent a 5c per barrel increase in price and bring Ben Franklin's posting up to level of several other large Oklahoma purchasers.

Oil a Factor In U. S.-Jap War Outcome

Oil undoubtedly will be a determining factor in America's war with Japan which broke with flaming suddenness over the Pacific bastion of Honolulu Sunday morning. But Japan's exact supply or even a pretty good guess—is something a lot of people would like to know.

Naval Intelligence, a close-mouthed, top-flight organization, certainly has as good a picture of Japan's petroleum reserve situation as anybody—but they're not talking. Disclosure would just be a good way to tell Japan how much we know.

But elsewhere, estimates of Japan's reserves range from 6 months to 2 years. One estimate, striking a balance, places Nippon's reserve at a level sufficient to last two years in peace, 18 months in war. Japan normally consumes somewhere between 24,000,000 and 30,000,000 bbls. each year.

Are Peace-Time Figures

Those figures apply to her consumption during peace-time. For the last few years, Japan has hushed up all information about her consumption.

While operations in the China "incident" undoubtedly have been such that total consumption would be sharply boosted, an opinion prevails in well-informed quarters here that drastic rationing in Japan has just about offset military increases.

However, this, too, is conjectural—just as is everything else with respect to Japan and her oil.

This much is not conjectural: Japan can supply from her own sources less than 8% of her supply.

A. P. I. *Petroleum Facts and Figures* — which, incidentally, placed 1940 consumption of Japan at 26,000,000 bbls.—showed that the enemy produced 2,639,000 bbls. of crude in 1940. In addition, Sakhalin produced about 4,000,000 bbls. Under agreement with Russia, Japan receives half of Sakhalin's output.

The United States previously supplied 65% of Japan's requirements; Netherlands Indies — now fighting at our side—25%.

The U. S. imposed its first embargo in August, 1940, placing restrictions on shipments of high-grade motor fuel and other high-grade products to Japan.

Imports from America of low-grade products kept up at a normal rate until this summer when crude and everything else, practically, was placed on the embargo list.

Economic Squeeze

In the view of many persons here, this encirclement proved so severe that Japan was forced either to back down from its militaristic program of conquest and its avowed "new order" or else act now while it still has the supply necessary for quick action.

One of the big questions is Japan's reserve of oil for the fleet. It has been reported, without confirmation, that earthquakes a few years back crumbled underground storage tanks that held fuel for the Navy. As a result, according to these reports, Japan was forced to construct above-ground storage — particularly vulnerable to attack from the air, an attack that may not be long in coming.

* * *

Navy Bid Invitations

Bid invitations announced by U. S. Navy Department last week are as follows:

Schedule LL-9635: Opening Dec. 5, 170,000 bbls. alkylate, delivery to be 85,000 bbls. during December and January, and 85,000 bbls. during February and March; f.o.b. tanker, East or Gulf Coasts or Aruba.

Schedule 9580: Opening Jan. 8, calls for various products, among them 12,440 lbs. ball-bearing lubricant, delivery within 90 days; 18,500 lbs. paraffin wax, delivery within 90 days; 412,800 lbs. paraffin wax, delivery within 75 days; 8950 lbs. petrolatum, delivery within 90 days; and 80 lbs. petrolatum, delivery within 90 days.

Schedule 9658: Opening Jan. 8, is for 3 lots of graphite lubricating grease, totaling 59,300 lbs., 10-lb. cans, various weights, delivery within 90 days East and West Coast; 354,890 lbs. mineral lubricating grease, in 3 lots, 10-lb. cans, various weights, delivery within 90 days East and West Coast.

Schedule 9724: Opening Dec. 11, is for 36,000 bbls. Navy fuel oil (Grade 1), and 7000 bbls. Diesel engine oil, delivery to be Key West, Fla., during December.

Schedule LL-9740: Opening Dec. 12, is for 287,994 gal. lubricating oil M-160; 287,994 gal. lubricating oil M-220; 287,994 gal. lubricating oil C-600; 275,982 gal. lubricating oil, Navy symbol 1120; and 180,000 lbs. grease, G.S. Delivery in drums or packages f.a.s. New York or Philadelphia during December.

Schedule LL-9747: Opening Dec. 12, 14,200 bbls. lubricating oil, Navy symbol 1080, delivery in nearly equal quantities during January, February and March, East or Gulf Coast. 63,900 bbls. lubricating oil, Navy symbol 1100, in equal quantities during January, February and March, East or Gulf Coast. 14,200 bbls. lubricating oil, Navy symbol 1120, delivery in nearly equal quantities during January, February and March, East or Gulf Coast.

Oil's Supply of Critical Materials From South Pacific Guarded by Navy

Flaming guns of the U. S. Navy, supported by strong units of the British and Dutch East Indies fleets, have been given the job of keeping open the supply lanes from the South Pacific—supply lanes that bring in critical materials with a direct bearing on the oil industry.

From the Orient comes tin, rubber, chromite, manganese, tungsten, graphite, mica for insulation, manila fiber, pig bristles for brushes, and a host of other things with a place in our every-day existence.

Other Items for War

Use of tin and rubber by the oil industry are obvious. Chromite, manganese and tungsten harden the steel used by the industry, graphite goes into some lube oils, mica splittings provide insulation necessary for electrical equipment, and there is no substitute for rope where rope is needed.

Then there are some other lesser items. Cocoanut oil, for instance, goes into glycerin. Palm oil, from the Netherlands Indies, is important to tin plating.

A good-sized stockpile of tin has been built up. A smelter is being constructed in Texas to refine Bolivian tin ore. With "careful conservation" of our present supply and possible expansion of the Texas smelter, Office of Production Management says we have enough to help us through the emergency.

While 98% of our rubber comes from this area, rubber can be re-claimed. We are using 70% crude rubbed to 30% reclaimed. In a few months, we can double the latter. Reclaimed rubber and the stockpile is sufficient to last for many months.

Loss of all imports of graphite, OPM says, will not seriously impair the war effort since deposits in Alabama, Texas and Pennsylvania will serve the purpose.

Trailer Curb Lifted

All restrictions on production of truck trailers were removed last week by Priorities Director Donald M. Nelson because they constitute an economical method of commercial highway transportation. Nothing specific was said about tank trailers.

Power Restrictions Lifted

The rains came to the drought-stricken Southeast last week, and good news came from Priorities Director Donald M. Nelson—all restrictions on power consumption were removed immediately.

Mr. Nelson issued an order on Dec. 5 lifting the "blackout" restrictions and the order freezing consumption of large power users to September levels. It had been previously announced that the "blackout" would be lifted on Dec. 15.

When he issued his order, Mr. Nelson said a heavy rainstorm had swept the area, averaging from 1 to 3 in. This means that more water is in storage reservoirs behind hydro-electric plants.

'Lead' Decision Holds Key to Octane Ratings

NPN News Bureau

WASHINGTON, Dec. 6—Octane ratings of most gasolines produced in the U. S. hang in balance as negotiations continue over raw material supplies for Ethyl Gasoline Corp. to make tetraethyl lead.

Ethyl's supplies of pig lead and chlorine have been curtailed by Office of Production Management. This has reduced current production of tetraethyl lead to about 60% of existing demand. Still further curtailment is being discussed by OPM which would bring the "lead" output down to less than half of the indicated demand for this anti-knock fluid.

This will reduce "regular" gasoline quality by at least 3 octane numbers—by 6 to 8 numbers, if the contemplated further curtailment is ordered, according to estimates made at conference of refining technologists and other interested parties at the Office of Petroleum Co-ordinator on Nov. 25.

'Knock' Hikes Fuel Use

Automotive engineers told the OPC conference that a reduction of 5 octane numbers in "regular" grade would be "extremely serious". Resultant increase in knock would be followed by a general retarding of spark to eliminate the knock, they said. Retarded spark and other measures to reduce knock would increase fuel consumption by at least 10%.

Increased fuel consumption would cost American motorists an estimated $250,000,000—and require the production of an additional 60,000,000 bbls. of crude annually—to travel the same number of car-miles per year as at present.

Thus, an added burden would be thrust upon American refineries already running at capacity, in most instances, and more crude would be consumed when government officials are already talking about a "crude shortage", it was pointed out.

'Lead' Importance Cited

Importance of tetraethyl lead to the petroleum industry has been pointed out to OPM, OPC and other defense agencies in data presented by the Ethyl corporation, by groups of refining technologists and individual refiners. Copies of a statement (dated Dec. 1) by Dr. Graham Edgar, Ethyl's chief technologist, are being circulated among defense agencies. A copy of Dr. Edgar's statement was made available to NPN by a defense official.

"At present, about 85% of all domestic gasoline contains tetraethyl lead," according to Dr. Edgar's paper. "Approximately 100% of all aviation gasoline, about 95% of all motor gasoline of 80 octane or higher, and probably 90% of all motor gasoline of about 75 octane number contains tetraethyl lead. Gasoline of about 80 octane number constitutes about 10% of all motor gasoline, and gasoline of about 74-76 octane number is about 80% of the total gasoline, the remainder being 'third grade' gasoline and that used for miscellaneous purposes."

265 Refiners Use 'Lead'

About 265 refiners—who between them produce over 90% of the country's gasoline, according to Dr. Edgar—use tetraethyl lead in all or nearly all of their gasoline.

"On the average," the Ethyl technologist continued, "the effect of tetraethyl lead on gasoline is about as follows: 1 c.c. of tetraethyl lead per gallon of gasoline increases the octane number by 7; 2 c.c. per gallon, by about 11; and 3 c.c. per gallon by about 14. Three c.c. per gallon is the maximum employed for automobile engines."

Curtailment of tetraethyl lead necessarily means a loss in the anti-knock quality of gasoline, according to Dr. Edgar who, after discussing "cracking" processes, said:

"Even if investment costs did not make prohibitive the installation of sufficient modern cracking equipment to compensate for its (lead's) loss, the staggering amount of steel required for such installation could not be spared from the defense effort."

Other methods of obtaining anti-knock value consist in blending gasoline with such materials as benzol or other high anti-knock fuels, the Ethyl man said. "Both economy and limited supply make such processes impracticable on any but a very limited scale," he said.

The availability of anti-knock compounds that might be used to replace tetraethyl lead in increasing gasoline octane number are very limited. The Bureau of Mines figures showed a total production of benzol at the rate of 8870 bbls. per day in September, 1941. Even if this were all utilized, it would only raise the anti-knock value of regular grade gasoline about 0.1 octane number. The few customers in steel plant areas who purchase this chemical at about 9c per gal. are finding the supply diminishing since there is a big demand for its use in phenol manufacture. Toluol and alcohol are likewise not available for this purpose.

'Lead' Use Doubles

Increased gasoline consumption, higher octane trend, reduced "lead" prices and aviation and other defense uses have doubled the demand for this anti-knock fluid in 4 years, according to Dr. Edgar. Consumption of tetraethyl lead totaled 94,000,000 lbs. in 1939, went up to 128,000,000 lbs. in 1940, while the 1941 demand was estimated at 160,000,000 lbs.

The 1942 "lead" demand has been estimated at about 210,000,000 lbs. as compared with a manufacturing capacity of about 225,000,0000 lbs. This would include 50,000,000 lbs. for aviation and defense; an increase of about 10% to correspond with the predicted increase in gasoline gallonage, and an unpredictable increase to compensate for the strain imposed on the petroleum industry by the defense program, Dr. Edgar explained.

"The tremendous program for 100-octane aviation gasoline," he continued, "will require stripping motor gasoline of some of its higher octane fractions, and, also, because of the enormous volume of all gasoline required, it will be necessary for the refiner to produce a maximum yield of gasoline and this in turn will reduce the over-all anti-knock quality. In the normal course of events these decreases in the quality of gasoline would be corrected by the use of ad-

Increased Fuel Consumption Would Cost Quarter Billion

Reducing the octane number of "regular" grade gasoline by 5, would affect an automobile's power and fuel consumption which would hit the motorist's pocketbook and put a severe burden on the oil industry, according to Dr. Edgar, Ethyl's chief technologist.

"It is at low speed, during acceleration, and in hill climbing or pulling a heavy load," said Dr. Edgar, "that anti-knock value is most important.

"It has been estimated by competent automotive engineers that a car requiring a 75-octane number gasoline to operate without knock could be made to operate on 70-octane gasoline by retarding the spark, and that this would have relatively little effect upon high speed performance, but that for average driving—city and country—a 10% increase in fuel consumption would be inevitable," he added.

Octane Requirements Vary

All cars do not need 75-octane motor fuel, though automobile compression ratios have steadily inncreased over a period of years. Octane number requirements vary even for a given year. To produce knock-free operation in 100% of all existing cars would require an octane number of about 85, said Dr. Edgar, with other lower percentages satisfied at lower octane levels.

While it is impossible to estimate exactly, gasoline consumption in the U. S. would be increased by 2,500,000,000 gal. yearly by a reduction from 75 to 70 octane number, according to the Ethyl technologist. This would cost the motoring public about $250,000,000 and require the production of an additional 5,000,000,000 gals. (nearly 60,000,000 bbls.) of crude oil, he said.

50% Would Need Adjustment

"At least 50% of all cars on the road would have to be taken to service stations for adjustment, and for those cars now requiring around 80-octane number, a major rebuilding job would be necessary to make them operate on gasoline of 70-octane number," Dr. Edgar said.

"It is clear," he added, "that any serious decrease in the octane number of gasoline would result in a tremendous drain on the refining capacity of the petroleum industry, on our resources of crude oil, and on the motorist's pocketbook."

ditional quantities of tetraethyl lead."

OPM Cuts Supplies

But the Ethyl corporation cannot supply this demand. After meeting aviation and defense requirements, Ethyl will have left only 50,000,000 lbs. to meet an estimated civilian demand of 160,000,000 lbs. in 1942—if OPM cuts its raw material supplies as drastically as is being considered. And this is due not to any lack of productive capacity, but to curtailed supplies of pig lead and chlorine and, possibly, alcohol.

Each pound of tetraethyl lead contains about two-thirds of a pound of pig lead. On basis of an average of 1 c.c. per gal., a pound of the anti-knock fluid is sufficient to bring 273 gal. of gasoline up to "regular" octane levels, on the average.

Pig Lead Demand Soars

U. S. domestic demand for pig lead now is estimated at between 100,000 and 110,000 tons per month, including about 47,000 tons for strictly defense requirements of the armed forces. Supply available from present sources (domestic and foreign) is running between 70,000 and 75,000 tons.

Obviously, indicated demand is far in excess of present normal supply. This abnormal demand has been due—besides military needs—to increased industrial activity and diversion from other metals to the use of lead.

Tinfoil Uses More Than 'Gas'

Tinfoil demand—to package cigarettes, candies, chewing gum, etc. — normally accounts for 2000 tons of pig lead per month but reports are that in recent months the amount of lead turned into tinfoil has expanded to at least 7000 tons per month. That is more lead than Ethyl would need to meet all demands for tetraethyl lead.

OPM had ordered a curtailment in tinfoil, on grounds that it was non-essential, but Reynolds Metal Co. put in a plea that this would throw 2000 people out of work and won a 60-day deferment.

'Marginal' Lead Mines Closed

U. S. pig lead output is still short of potential production, despite the heavy, unfilled demand. Until recently, quite a few of the high-grade ore mines apparently had not started operating on a 24-hour basis. "Marginal" mines—those with low-grade ores or high production costs—are still closed because they are unable to operate at present lead prices which have been pegged by Leon Henderson's Office of Price Administration (5.85c per lb. at New York and 5.70c at St. Louis). OPA's "too low" prices also shut out imports from Mexico.

Higher Price Would Open 'em

During the Nov. 25 conference at the Petroleum Co-ordinator's Office, a metals specialist from OPM stated that a lead price advance to 7c per lb. would bring into production mines producing low-grade ores.

Thereupon, Ethyl corporation officials pointed out that a price increase to 7c wasn't a serious obstacle, since the cost of pig lead was but a small factor in the total cost of tetraethyl lead.

If Price Administrator Henderson is willing, perhaps Ethyl could work out a deal with the marginal mines to start up production under encouragement of a high price. Indications are that Ethyl is exploring this angle. But there remains the possibility that OPM would step in and commandeer this new lead supply.

The effect of an increase in price of pig lead of 1c, 2c and 3c per lb. is practically negligible in the price of gasoline. Assuming one gal. of gasoline contains 1.4 c.c. of tetraethyl lead, containing 64% by weight

Millions of Cars Will Knock If Octane Gasoline is Cut

NPN News Bureau

CLEVELAND, Dec. 6.—Surveys of a random group of over 500 typical owner-driven cars, selected by number, make and year in proportion to cars in service, have been made by an oil company laboratory to determine knock at various octane number levels. This unpublished data, made available to NPN, shows:

Knock Tests Made

At existing level of 76 (ASTM) octane number, 5% of the cars on the road give at least a light knock and 26% give at least a "trace" knock. If reduced to 72-octane number, the number of cars giving "light" knock would increase 4-fold and the number giving "trace" knock 2-fold. And at 68, the increase for "light" knock would be 9-fold and for "trace" knock about 2½ times.

In terms of numbers of cars involved, these percentages indicate drivers of about 5%, or 1,700,000, out of the 34,000,000 automobiles now on the road are conscious of "light" knock. A 4-number decrease in octane would make about 5,400,000 motorists knock conscious, an 8-octane decrease would make about 13,000,000 additional drivers knock conscious.

Experience has shown that knocking is objectionable to the driving public and that the public will go to considerable pains to reduce or eliminate knock in their cars, whether or not the presence of this knock results in or threatens any mechanical damage or loss in performance.

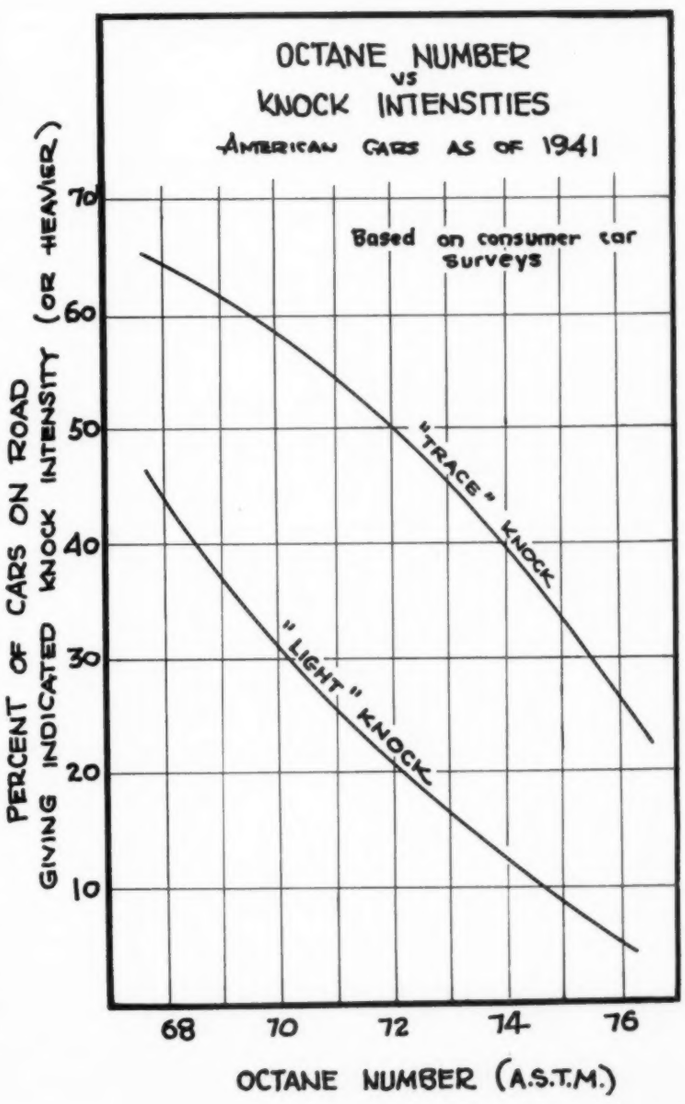
Knock Hurts Efficiency

A large percentage of car owners, newly conscious of knock, probably would endeavor to eliminate this knock by various means.

Some drivers would probably switch to another brand of gasoline and then attempt to use premium grade. Should these means be ineffective or unavailable, the car owner would probably resort to mechanical means to eliminate the knock. And these means would reduce the economy and performance of the car.

Lower Octane 'Serious'

Mechanical effects of reduced octane number will be serious for commercial consumers. Many fleet operators have made adjustments to utilize available octane number to the maximum, changing pistons and cylinder heads, set of carburetors and ignition systems for most economical operation. Substantial reduction in octane number to such operators would in many cases require large mechanical changes to restore fleets to conditions existing several years ago. In many cases, operating schedules and net load-carrying ability will be affected because of reduced performance of the vehicles corrected for lower-octane fuels.



of pig lead (or 0.0033 lbs.) this increased price of the pig lead will mean 0.0033c, 0.0066c *and* 0.0099c *respectively in the increased cost of a gallon of gasoline. Therefore, the low grade ore mines could be operated with little effect upon the cost of leaded gasolines.*

Chlorine Supply Threatened

Chlorine now used in the manufacture of tetraethyl lead is a relatively small amount compared with national consumption but not too small to escape the notice of OPM.

About 75% of total chlorine produced in the U. S. is now going into the manufacture of direct defense materials such as explosives, ethylene dichloride, etc. Normal consumers of chlorine—dry cleaners, pulp and paper industry, refrigerant manufacturers and others—have had their supplies cut drastically. Some of these consumers are shouting their woes to high heaven while casting covetous eyes at chlorine producers and other consumers, like Ethyl.

Ethyl both produces and consumes chlorine now. With completion of its new Baton Rouge plant in early spring, Ethyl will become self-sufficient on its chlorine supply. This project (hydrochloric process) will put Ethyl in the position of producing as a by-product of its lead-making operations more chlorine than it consumes. The more "lead" Ethyl makes, the more chlorine. So, any reduction then in tetraethyl lead output will have the effect of reducing the chlorine supply available to other defense industries.

It is difficult to state the exact consumption of chlorine for tetraethyl lead manufacture. According to figures submitted to Washington, the amount consumed, based upon present production rate of tetraethyl lead (150,000,000 *lbs. per year) is* 46,500 *tons of chlorine per year. This represents approximately* 9.6% *of the* 485,000 *tons of chlorine capacity in the U. S. in* 1940.

Continental to Increase 100-Octane Output

NPN News Bureau

TULSA, Dec. 6.—Plans for increasing by 300 bbls. daily the output of 100-octane gasoline at Continental Oil Co.'s Lake Charles, La., refinery were announced here this week.

The program calls for expenditure of approximately $375,000 on new equipment for recovery of more iso-butane and segregation of iso-pentane.

Construction will begin in the next 6 to 10 months, depending on availability of materials.

New Process Will Boost Yield Of 100-Octane Aviation Fuel

NPN News Bureau

CHICAGO, Dec. 6 — A new process for converting low octane naphthas into material of over 80 octane number for use as base stock in the manufacture of 100-octane aviation gasoline was announced this week by Standard Oil Co. (Indiana).

The process, it is said, will greatly increase the amount of high-octane aviation gasoline available to the nation in its now enlarged war program, by reducing the proportion of the synthetic agent (such as alkylate, "iso-octane" or iso-pentane) which is blended with base stocks to produce 100-octane fuel. At present, it takes about 65% of the synthetic agent to 35% of the base stocks to make the finished gasoline. With the improved base stock of higher octane number, as produced by the new Indiana Standard process, it is said to be possible to use only 40% of the blending agent and increase the proportion of the more widely available base stock to 60%.

In view of the potential importance of the process to national defense, said the announcement from Indiana Standard, the company has notified the Office of Petroleum Co-ordinator at Washington of its willingness to license the process immediately to other refining companies.

The process, which the company says will probably be known as the "Isomate" process, applies the principle in chemistry of isomerization to convert straight-chain hydrocarbon molecules to the branch-chain molecules which compose the material of higher octane rating.

Hikes Naphtha Rating

Operating details have not been made public but company engineers stated they include the use of a catalyst and relatively low temperatures, around 300° F. The method raises the rating of the naphthas (straight-run gasoline) from 65 to around 81. The yield is said to be 98%.

Indiana Standard has named the M. W. Kellogg Co. of New York, refinery engineers, as licensing agent. The minimum capacity unit practicable to operate is at present believed to be between 500 and 1000 bbls. per day.

Edgar Tells Cause, Effect Of Ethyl Fluid Allocation

I. Introduction

This memorandum is an attempt to outline briefly the position of the tetraethyl lead industry in the fields of national defense and civilian use, its consumption of strategic raw materials at different operating levels, and the effects of its curtailment upon the petroleum industry, the transportation industry, and the general public. All figures and estimates are believed to be as accurate as it is possible to obtain, and more detailed supporting data from reliable sources are always available. It is hoped that the memorandum may be useful to those government agencies having the task of allocating raw materials to industry, both for defense and civilian uses.

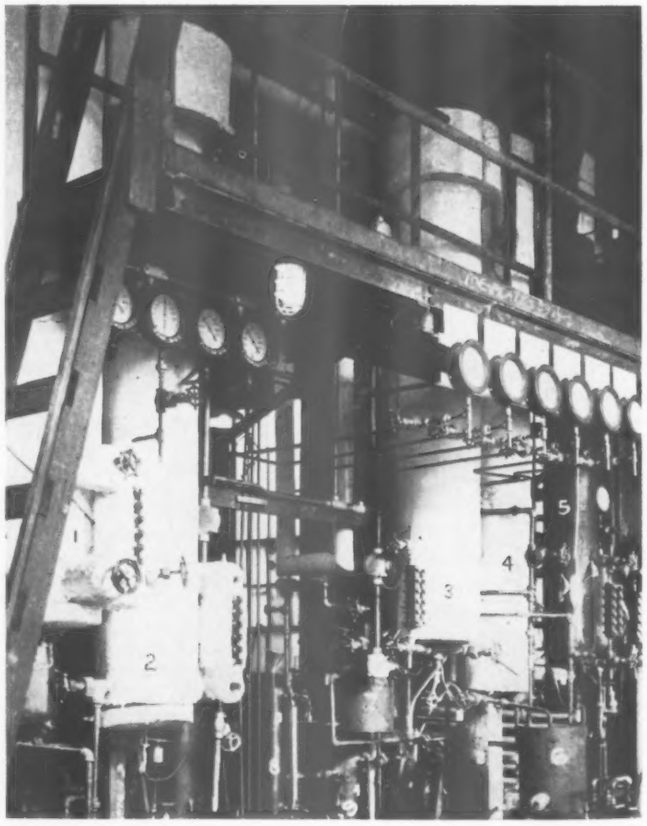
II. Uses of Tetraethyl Lead

Tetraethyl lead mixed with certain other constituents is used to increase the anti-knock value of gasoline. Hereafter, where tetraethyl lead is referred to, the finished anti-knock fluid is implied. At present, about 85% of all domestic gasoline contains tetraethyl lead. Approximately 100% of all aviation gasoline, about 95% of all motor gasoline of 80 octane number or higher, and probably 90% of all motor gasoline of about 75 octane number contains tetraethyl lead. Gasoline of about 80 octane number constitutes about 10% of all motor gasoline, and gasoline of about 74-76 octane number is about 80% of the total gasoline, the remainder being "third grade" gasoline 10% and that used for miscellaneous purposes.

III. Tetraethyl Lead in the Direct Defense Picture

The importance of tetraethyl lead to defense is so well known that it will be treated very briefly. It is perhaps fair to say that without the availability of tetraethyl lead, the modern military and transport airplane could not have been developed, and the plane of today could not get off the ground if tetraethyl lead suddenly became una-

(*Continued on Page* 42)



Pilot plant at the Whiting, Ind., refinery of the Indiana Standard, where the new "Isomate" process for converting naphtha into improved base stocks used in making 100-*octane aviation gasoline was developed*

THE Editor's PAGE

Readers Comments and Opinions will be much Appreciated by—WARREN C. PLATT. Editor and publisher. Penton Building, Cleveland, O.

Oil in Excellent Shape to Meet Our New War Demands

THE oil industry is exceedingly well prepared for this war that came upon us Sunday. That is well shown by how the industry has responded to the heavy demands for all petroleum products that have been increased steadily by the "war defense" of the past two years.

The oil industry now is manufacturing more products than ever before. In the past year it has increased its crude runs through the stills from 3,500,000 bbls. a day to 4,100,000 bbls. a day this month, an increase of 17%. In the past 8 years the increase in product output has been more than 50%. And crude oil production has kept right along with this demand.

Stocks of crude oil are still large; more than 240,000,000 bbls. are above ground. This is the lowest figure in recent years as the industry has been reducing above-ground storage as fast as circumstances permitted because of the great carrying expense and waste of the light ends of the oil. Modern conservation methods and state regulations keep "stocks" below ground. The latest of conservation practices now obtain in practically all of the country's great fields.

HOW great is the industry's reserve ability is shown by the way it successfully met the gasoline and heating oil "shortage" on the East Coast when tankers were put into British service. It now appears that there actually was no shortage so far as the consumers were concerned while today, with not all the loaned tankers back in domestic service, East Coast gasoline stocks are up more than 2,000,000,000 bbls.; heating oils almost 6,000,000 bbls.; and heavy fuel up 27,000 bbls. over a year ago. This was done by reorganizing the oil industry's vast transportation system to meet the unexpected emergency.

The war is calling on the oil industry for more new products, 100-octane aviation gasoline and many chemicals. In these the industry has more than met the government's demands, faulty though the government's estimate of requirements frequently has been.

The industry also is in probably about as good a shape as possible in having its own machinery in oil associations of all kinds through which to work to meet war demands.

The industry also is in good position in its relations with government. The experience of the late code days taught oil and government men at least many ways of how not to do things. Then the late affair of the East Coast "shortage" gave the government machinery organized to meet it a chance to show its weak spots. The present plan of a new over-all industry committee to represent directly the oil associations and including the top executives of the major oil companies, as is being organized by Petroleum Co-ordinator Ickes this week, promises such government co-operation with the industry as will permit oil men to meet war demands in the most efficient manner.

All this does not mean that the oil industry will not have its difficulties. Today's war is developing on such a vast scale that most anything can happen. There will be difficulty in getting equipment, as there is today. Unusual demands for certain products will force changes in refining operations and in product specifications, as we are experiencing today. There can easily be transportation difficulties, such as we had this summer. We may even run into some real shortages due to excessive demand for war and transport troubles.

But whatever troubles may befall this country, the oil industry is so well organized, so experienced, and so well provided with raw material and facilities and men, that, from every present outlook, the country need fear no handicaps in its war efforts, PROVIDING the oil industry is given full opportunity to do its own thinking, its own planning and its own acting and that it has the CO-OPERATION of the administration.

OPA's Price Fixing Efforts Suggest Studied Attack on Oil?

A FAIR illustration of the inefficiency of the bureaucratic hand on industry controls, is the present shortage by government decree of pig lead from which tetraethyl lead is made.

Again we find OPA blocking the way of the oil industry to render service to the country. OPA refuses, up to the present moment, to allow a cent or two advance in the price of pig lead so as to bring into production higher cost mines that are now idle, and so as to bring into this country imports of lead from similar higher cost mines in Mexico.

The administration at Washington has been loudly proclaiming a "good neighbor" policy to Mexico. It just recently agreed to supply money to Mexico to help it pay some of its debts to American property holders. The Washington administration also has been buying much silver, a comparatively useless metal, from Mexico at far higher than open market prices. Yet this administration, through OPA, refuses to extend the "good neighbor" policy on a few thousand tons of lead at a cost to American lead users of a cent or two cents a pound. It might at least let Mexico make a payment on the oil properties it seized from American oil companies with a little much needed lead.

OPA, in its dealings with the oil industry, has persistently refused to help increase necessary supplies by allowing any increases in oil prices.

OPA would not permit increases in East Coast prices during the gasoline and oil "shortage" there this summer, to compensate for higher transportation costs by more expensive means of transportation, and to increase the East Coast supply.

OPA would not approve an increase in crude prices for Pennsylvania producers who wanted to find and raise more oil right in this "shortage" territory.

So far, OPA has refused to approve any increase in crude prices generally so as to start a drilling and wildcatting campaign for new oil discoveries that probably will be greatly needed before this war is finished.

And now OPA refuses to allow the price of lead to be raised so that American truckers and car owners will not be penalized by having to use a far less efficient gasoline.

OPA and some of the New Deal anti-inflationists have been urging price control chiefly on the argument that increased general employment and necessary decreased production of automobiles, refrigerators and all such desirable "consumer goods" provides a far greater demand for these goods than can be met under war circumstances. This demand, it is argued, forces steadily advancing prices unless such prices are controlled.

Yet in oil, on whose prices OPA is laying its heavy hand, there is no shortage, and none is threatened, except as OPA itself creates a shortage by its deliberate price policies toward oil.

Another inconsistency of OPA is shown by a statement of an OPA deputy commissioner in a speech at New York last week. Ceilings on retail prices

are not needed, he said, because retailers are "already doing a good pricing job" and retailing is so highly competitive that competition checks runaway prices.

Why this theory of no price regulation does not apply to the oil industry is anyone's guess. Certainly in oil distribution we have had the most severe competition which has over the years lowered prices to the consumer. This competition is so keen and drastic—even cut throat—that hardly a month goes by when Independent jobbers and retailers are not calling on the Department of Justice for protection. And right now jobbers in the West have made complaints to Washington about a "squeeze" due to "too much" competition.

Yet in the face of this record, OPA has frozen all oil prices, except industrial oils, greases and specialties.

One cannot help but wonder if there is not in the New Deal some over-all plan of attack on the oil industry regardless of what happens to its Independent competitors and regardless of its necessary, and to date, excellent service to the country?

Higher Rail Wages Force Greater Truck Use

WITH the settlement of the threatened railroad strike by saddling $300,000,000 a year more wages on the railroads, Priorities Director Nelson removes all restrictions for materials for truck trailers.

It would seem that the priorities director realizes that the railroads will have to have higher freight rates, which they are about to ask for, in order to pay this big increase in labor cost, and that these higher freight rates will be a burden on the country and will force the shippers to look to trucks for more transportation.

The priorities director also undoubtedly is anticipating the continued great increase in general demand for more transportation. If this country undertakes preparations for any 5,000,000-man foreign expeditionary force, such as has been indicated by disclosures of War Department plans, it will be practically impossible for us to have too many trucks and trailers and other means of transportation.

These developments will put a further demand on the oil industry for its products and, if the freight rates are increased on oil to pay the railroad unions increased wage bill, the oil industry itself will be a still greater user of trucks and trailers. The greater use of gasoline pipelines and water transportation, especially barges on inland streams, makes it all the more necessary for competing oil companies to find cheaper means of transportation than the already too high freight rates, or else they will have to quit business.

OIL men have sympathy for the railroad men in their being hi-jacked into the wage increase, just as the roads were hi-jacked under strike threat by their unions as we entered the last war, but oil men must live and few of them can live and pay high rail rates.

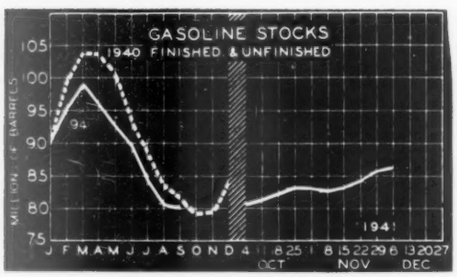
So there is every indication that just as there will be a still greater use of trucks and trailers by industry in general, so there also will be a greater use by the oil industry itself.

Refinery Operations

(American Petroleum Institute Figures in Thousands of Barrels of 42 Gallons each)

Districts	Daily Average Crude Runs to Stills Week Ended Dec. 7	Daily Average Crude Runs to Stills Week Ended Nov. 29	Per Cent of Reporting Capacity Operated Week Ended Dec. 7	Per Cent of Reporting Capacity Operated Week Ended Nov. 29	Gasoline Production At Refineries in Natural Blended Week Ended Dec. 7	Gasoline Production At Refineries in Natural Blended Week Ended Nov. 29	Total Stocks Finished & Unfinished Gasoline Week Ended Dec. 7	Total Stocks Finished & Unfinished Gasoline Week Ended Nov. 29	Total Stocks Gas Oil & Distillates Week Ended Dec. 7	Total Stocks Gas Oil & Distillates Week Ended Nov. 29	Total Stocks Residual Fuel Oil Week Ended Dec. 7	Total Stocks Residual Fuel Oil Week Ended Nov. 29	Stocks Aviation Gasoline Included in Finished & Unfinished Gasoline Total Week Ended Dec. 7	Stocks Aviation Gasoline Included in Finished & Unfinished Gasoline Total Week Ended Nov. 29
East Coast	633	653	92.3	97.0	1,898	1,998	19,421	19,435	21,906	22,092	12,151	12,539		
Appalachian	134	143	96.4	102.9	406	478	3,472	3,447	626	696	415	414	East Coast 623	680
Ind., Ill., Ky.	608	663	95.7	104.4	2,404	2,632	15,539	15,469	5,499	5,542	4,400	4,560		
Okla., Kans., Mo.	245	298	73.6	89.5	1,085	1,262	7,945	7,858	1,913	2,023	2,124	2,232	Interior 1,485	1,466
Inland Texas	124	123	74.7	74.1	644	543	2,395	2,410	457	463	1,269	1,318		
Texas Gulf	1,024	1,051	102.5	105.2	3,486	3,311	12,206	11,599	6,969	6,590	8,006	7,974	Gulf Coast 2,541	2,685
La. Gulf	149	191	90.9	129.1	449	499	2,857	2,937	1,617	1,686	2,331	2,296		
N. La., Ark.	53	44	112.8	93.6	157	136	486	428	324	340	343	358	California 2,244	2,221
Rocky Mt.	37	46	54.4	67.6	211	235	1,144	1,134	140	145	337	346		
California	553	517	77.3	72.3	1,554	1,585	15,516	15,458	12,895	12,964	62,791	62,684	6,893	7,052
Reported	3,560	3,729	90.1	95.1	12,294	12,679	80,981	80,175	52,346	52,541	94,167	94,721	400	405
Estimated Unreported	385	386			1,365	1,410	5,375	5,350	1,600	1,600	1,175	1,250	7,293	7,457
U. S. Total*	3,945	4,115			13,659	14,089	86,356	85,525	53,946	54,141	95,342	95,971	6,324	
U. S. Total 12-7-40*	3,457				11,514		80,351		44,977		103,657			

*Estimated, U. S. Bureau of Mines basis.


GASOLINE STOCKS
1940 FINISHED & UNFINISHED
MILLIONS OF BARRELS
1941
J F M A M J J A S O N D 4 11 18 25 1 8 15 22 29 6 13 20 27
OCT
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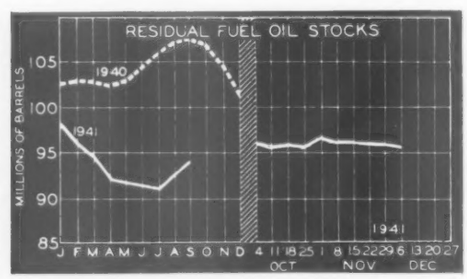
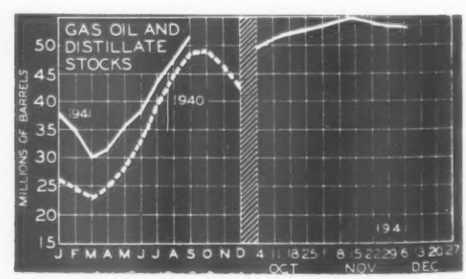
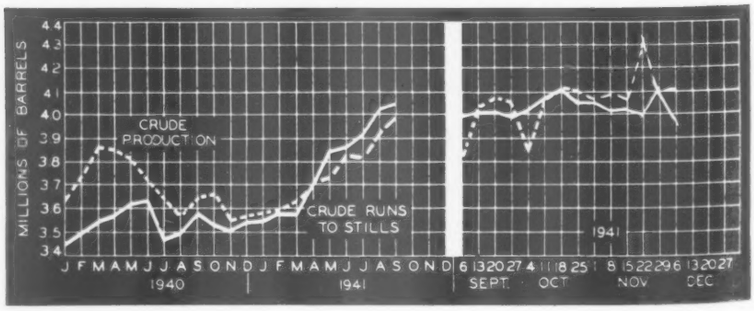




Crude Oil Production

(American Petroleum Institute figures)

	WEEK ENDED Dec. 6 Barrels (Daily Average)	WEEK ENDED Nov. 29 Barrels (Daily Average)
Oklahoma	416,550	425,100
Kansas	240,700	249,200
Nebraska	5,850	5,800
Texas	1,492,150	1,472,650
Louisiana	359,750	348,450
Arkansas	73,950	74,050
Mississippi	74,700	74,450
Illinois	398,600	400,300
Indiana	20,100	18,400
Eastern (Ill. & Ind. excl.)	93,300	96,250
Michigan	53,150	56,950
Wyoming	85,550	82,050
Montana	21,450	21,400
Colorado	5,450	5,350
New Mexico	117,800	117,800
California	648,900	638,400
Total U. S.	4,107,950	4,086,600


CRUDE PRODUCTION
CRUDE RUNS TO STILLS
MILLIONS OF BARRELS
1941
J F M A M J J A S O N D J F M A M J J A S O N D 6 13 20 27 4 11 18 25 1 8 15 22 29 6 13 20 27
1940
1941
SEPT.
OCT
NOV
DEC

That's what she heard Daddy say when he put Mobil Freezone in *his* car. It's good advice for all car-owners.

Socony Vacuum Oil Company, Inc. . . . maker of Mobil Freezone . . . packs the well-known anti-freeze compound in Crown Cans that are as attractive as they are sturdy . . . as effective when on display as they are protective during shipment.

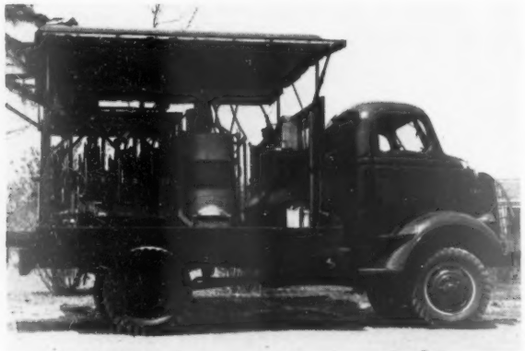
Probably no company has had greater opportunity to compare the quality of metal containers than Socony Vacuum whose market is worldwide.

Their choice of Crown Cans for Mobil Freezone is one more recognition of Crown's dependability by a major operator. Have you looked into Crown's facilities, as applied to *your* operations?

CROWN CAN COMPANY, PHILADELPHIA, PA., *Division of Crown Cork and Seal Company,* Baltimore · St. Louis · Houston · Madison · Orlando · Fort Wayne · Nebraska City

INDEPENDENT AND HELPFUL CROWN CAN

Oil Men Help Write 'Specs' for Ordnance Lubes



Above shows a side view of U. S. Army Ordnance Department's experimental lubrication truck. This unit can lubricate 2 vehicles simultaneously. On a recent test, this unit completely lubricated 4 light trucks in 18 minutes

Capt. George H. Schoenbaum

Carefully-developed lubricants for U. S. Army's small arms, artillery, fire control instruments and ordnance automotive materiel will now undergo War's acid test.

Product selection and development of lubricant specifications is the continuing duty of the Fuels and Lubricants Unit of the Army's Ordnance Department, which collaborates with manufacturers. The ordnance unit is "from Missouri" when it comes to new lubricants, requiring proof that they are needed before approving new specifications. This is to keep down number of different lubes.

Chief of the Fuels and Lubricant Unit is Capt. George H. Schoenbaum, for 10 years a New Jersey Standard engineer before resuming his Army duties.

Under surveillance of this Unit are fuels, lubricants, rust preventatives, recoil fluids, hydraulic fluids and certain cleaning materials which are required for various small arms, artillery, fire-control instruments and armored vehicles.

Men working with Capt. Schoenbaum in the Fuels and Lubricants Unit follow:

First Lieutenant John C. Cramer, a graduate of University of Kentucky with a B.S. in mechanical engineering. A year's training in motor fuel research and general refinery engineering in Jersey Standard's Student Engineering Training course was followed by employment in Standard Oil Development Co. Later he was transferred to Jersey Standard and made head of the Safety Inspection Dept. at the Baltimore Refinery. On April 5, 1941, he was called to active duty with the Army and assigned to Fuels and Lubricants Unit.

Irvin A. Ebaugh, a graduate of Tulane University with a B. E. in chemical engineering, spent 3 years as a research chemist in Navy Stores Industry and 12 years in petroleum industry which was about equally divided between Arkansas Fuel Oil Co. and Texaco. He is now principal civilian assistant to Captain Schoenbaum.

First Lieutenant Val A. Gates has a B.S. in electrical engineering from University of California. Following graduation he spent a year on active duty, later being employed by Shell at Martinez, Calif. After 4 years as a motor laboratory research engineer with Shell, he was ordered to duty, later being transferred to Office of the Chief of Ordnance in Washington.

B. A. O'Neill attended U. S. Naval Academy at Annapolis; later graduated from University of Maryland with a B.S. in mechanical engineering. In 1936, he became an automotive research engineer with Gulf Research and Development Co. In October, 1940, Mr. O'Neill was employed as assistant mechanical lubrication engineer in Office of the Chief of Ordnance.

First Lieutenant James A. Richardson, III, was graduated from University of California with a B.S. in mechanical engineering. After 1 year with Tide Water Associated Oil Co. in its research and development department he worked 8 years for Shell Oil Co., 2 years in refinery operations, 1 year in research and 5 years in technical applications department.

Captain Schoenbaum, chief of this unit, was graduated from Virginia Polytechnic Institute in 1930 with a B.S. in chemical engineering. He was appointed chief of Fuels and Lubricants Unit when it was established in October, 1940.

First Lt. V. A. Gates

B. A. O'Neill

First Lt. J. C. Cramer

I. A. Ebaugh

First Lt. J. A. Richardson III

WITH THE ASSOCIATIONS

Pacific War Gives Impetus To Diesels, S.A.E. Hears

Special to NPN

WICHITA, Dec. 8—Progress report on simplification and standardization of fuels and lubricants to obtain maximum efficiency of the "propelling vitamins" (liquid fuels), was presented here Dec. 6 by C. M. Larson of New York, chief consulting engineer for Sinclair Refining Co.

Members of the Wichita and Tulsa sections of the Society of Automotive Engineers were told by the Sinclair engineer that only through co-operative planning of all—industry, Army, Navy and federal agencies—can the fullest utilization of fuels and lubricants be had through simplification.

With the U. S. driven into a war in the Pacific, maintenance of a 7000-mile supply line through the "back door" will force simplification, the speaker said. Such contingency would bring the diesel engine to the fore, since only one half of the fuel would be required for such mechanical equipment, he predicted.

The Quartermaster Corps' requirements of about 240,000 vehicles for an army of 1,400,000 men is a reality, he said. Such units average about 35 miles per day, with each armored division consuming about 1000 gal. of gasoline per mile. To these requirements, must be added those of the air service, shops, guns, railroad equipment and stationary equipment.

Standardization Aims

Accomplishments in the simplification of fuels and lubricants listed by Mr. Larson included:

1. Use of 2 grades of gasoline instead of the previous 5; all purpose 80-octane fuel for all vehicles, tanks and stoves, and 100-octane for aviation on motors.

2. Standardization on a 50-minimum cetane fuel equivalent to Navy diesel fuel specifications 7-0-2 (INT) for tractors and diesel powered tanks.

3. Vehicles and tanks of the motorized and armored divisions have been standardized around SAE 10, 30 and 50 engine oils.

4. For diesel engines, heavy duty additive type oils, conforming to Caterpillar and G.M.C. 71 specifications, will be used.

5. Establishment of a chassis lubricant around a soda soap grease, with a view to using it not only for pressure fittings, steering drive ends and universal joints, other than needle bearings, but also for wheel bearings as well.

6. With modern new equipment there is no need for carrying a waterproof grease for vehicles and tractors, and efforts are being made to discontinue this practice.

7. One hydraulic brake fluid product, two recoil oils and one lubricant for small arms are now used.

8. Rust preventatives are undergoing radical changes of standardization.

Portable Pipeline Described

The Army is using 750-gal. tank trucks with demountable tanks that may be transferred from a disabled truck to a serviceable truck. Five-gallon containers are used for fuel and most engine oils. Use of a pumping unit— dubbed the "cow"—enables filling of eight 5-gal. tins at one time.

Mr. Larson described use of a 3-in. gasoline line about a mile long that was used to dispense 80-octane motor fuel from tank cars to tank trucks and 5-gal. can. A tank car is emptied in 2.5 hours by this method. Such a line can be laid or taken up at the rate of 100 ft. in 10 minutes, he said. A 3-mile line was used in South Carolina maneuvers recently to fuel airplanes from a tank car.

Oil's Chemicals Needed

Borrowed from the American Chemical Society that was meeting here the same night, Col. M. B. Chittick of the Chemical Warfare Department explained the importance of petroleum as a major chemical industry. He challenged the oil industry to fill the gaps in chemical requirements that have resulted from dislocation of regular chemical sources.

Earlier in the day, the engineers were taken on an inspection tour of a local aircraft factory.

Christmas Parties Set By Two Oil Clubs

NPN News Bureau

CLEVELAND,—Chicago Oil Men's Club and the Indianapolis Oil Club will throw gala Christmas parties on the same date—Dec. 18—according to announcements.

The Indianapolis club, headed by Sam Hurd, will hold its party in the Rainbow Room of the Severin Hotel in Indianapolis. "Special music and entertainment with a large number of attractive door prizes are being provided and a cordial invitation is extended to oil men and suppliers who may be in Indianapolis on that date to attend," is the promise held forth in the announcement.

Details of the Chicago party have not been announced.

A.P.I. Reorganization Committee Selected

NPN News Bureau

NEW YORK, Dec. 8.—President W. R. Boyd, Jr., of American Petroleum Institute today announced appointment of a committee on reorganization of the functions and structure of the A. P. I. Committee was authorized by Institute's board of directors at recent annual meeting in San Francisco.

President Boyd named George A. Hill, Jr., Houston Oil Co. of Texas, as chairman, and the following as members of the committee: John A. Brown, New York, Socony-Vacuum; H. D. Collier, San Francisco, California Standard; O. D. Donnell, Findlay, O., Ohio Oil Co.; W. S. Farish, New York, New Jersey Standard; J. Howard Pew, Philadelphia, Sun; W. S. S. Rodgers, New York, Texaco; E. G. Seubert, Chicago, Indiana Standard; H. F. Sinclair, New York, Consolidated; W. G. Skelly, Tulsa, Skelly Oil Co.; and R. G. A. van der Woude, New York, Shell Union.

Oil Expo Postponed

NPN News Bureau

TULSA, Dec. 8—The 1942 show of the International Petroleum Exposition at Tulsa has been postponed as result of present emergency conditions.

Originally scheduled for Tulsa May 16-23, dates for the oil show will be re-set by a special committee to be appointed later.

Nebraska's Oil Men Hit Price 'Freeze'

Special to NPN

OMAHA, Nebr., Dec. 6.—Leroy L. Snyder, Blair, Nebr., was re-elected president of the Nebraska Petroleum Marketers at its annual convention here this week where resolutions were passed calling for (1) rescission of Office of Price Administration's price "freeze" request, (2) priorities for retail oil marketing, (3) elimination of diversion of highway funds, (4) deferred automobile registration to April 1 each year, (5) opposition to restrictive limitations on truck sizes and weights and (6) inclusion of Independent marketers on the Petroleum Industry Council for National Defense.

Other officers re-elected were: Mabel C. Herman, Fremont, Nebr., first vice-president; Guy Thompson, Alma, Nebr., director; and D. J. Traill, executive secretary. The association elected O. J. Shaw, Lincoln, Nebr., as new second vice-president and William Trenchard, Cambridge, Nebr., as a new member of the board of directors.

A great deal of credit for the successful convention, which drew over 500 oil men, goes to W. R. (Mike) Schaefer of Omaha, chairman of the convention committee. A new feature of this year's convention was a centralized recreation room, immediately labeled the "Rumpus" Room".

Chicago Oil Men Elect Officers

NPN News Bureau

CHICAGO, Dec. 6.—Holger Jensen, Chicago, of Jensen Petroleum Co., was elected president of the Chicago Oil Men's Club here this keek. J. Glen Phinney of Cities Service was elected vice-president; George N. Olson of George N. Olson Co. was elected treasurer; and Lon C. Denning of John Oil Refining Co. was elected secretary.

Directors elected for 1942 were: Harry Lightstone, Kanotex Refining Co.; Charles J. Wood, Harry P. Dunn Co.; and R. J. Geagan, Sinclair.

California Fuel Oil Market in Canada Narrowed as Rails Use Alberta Crude

Special to NPN

TORONTO, Dec. 4.—A considerable market for the heavy crude oil from the Vermilion-Wainwright-Rebstone field in Alberta is opening up for railway locomotive fuel, Assistant Oil Controller George B. Webster told NPN today. Mr. Webster has just returned from a trip of inspection in western Canada.

This crude which runs 14 degrees Baume, is to be used on the mountain divisions of both the Canadian Pacific and Canadian National Railways, which have formerly been supplied with fuel oil from California. The railways are using about 200 oil burning locomotives on this division.

There are 7 or 8 wells now producing in this field, and several more will be brought in very shortly. The crude oil is put through a simple cleansing process to remove sand and water, after which it is ready for use. The railways are said to be in the market for roughly 1,250,000 bbls. of fuel oil annually at $1.15 per bbl.

Overland Oil Shipments To East Drop Lower

NPN News Bureau

WASHINGTON, Dec. 6. — Tank car movement of petroleum into east coast states dropped off 48 cars for week ending Nov. 29, as compared with previous week, or from 3113 to 3665 cars, Office of Petroleum Co-ordinator reported.

Month ago, figures stood at 4046 cars, week ending Oct. 25.

Companies participating in week ending Nov. 29 are:

Atlantic, 392 cars; Cities Service, 142; Gulf. 205; Pan-American, 163; Pure, 58; Shell, 231; Sinclair, 440; Socony-Vacuum, 104; Kentucky Standard, 61; Jersey Standard, 858; Sun, 18; Texaco, 164; Tide Water, 229.

Kunze Named Manager Of Socony's Tankers

Charles H. Kunze, who started his oil industry career as an office boy when most oil exports were made in packages in sailing vessels, was named manager of Socony-Vacuum's marine transportation department at New York last week. He succeeds Walter E. Simpson who retired Dec. 1 after 40 years of service.

September 'Gas' Use Climbs 11.22%

NPN News Bureau

NEW YORK, Dec. 6.—Daily average consumption of gasoline in the U. S. during September was 11.22% higher than during September, 1940, American Petroleum Institute reports.

Daily average increase for the first 9 months of 1941 over the same period last year was 12.24%.

Jersey Standard to Build Mississippi Pipeline

NPN News Bureau

TULSA, Dec. 8.—New pipeline outlet for the Tinsley, Miss., field has been announced by Oklahoma Pipe Line Co., New Jersey Standard subsidiary. Line will extend to Baton Rouge, La., where it will make Mississippi crude available for Atlantic Coast deliveries.

The 10-in. line will have a capacity of 20,000 bbls. daily. Installation of additional pumping stations could double this capacity. Construction will begin in 2 or 3 months, depending on pipe deliveries.

30% of New York's Cars Waste 20% of Gasoline

NPN News Bureau

NEW YORK, Dec. 6.—Thirty per cent of the engines of automobiles in New York City are operating at less than 80% fuel efficiency, complete returns on tests taken at city-operated testing stations throughout a 10-day period late last month show.

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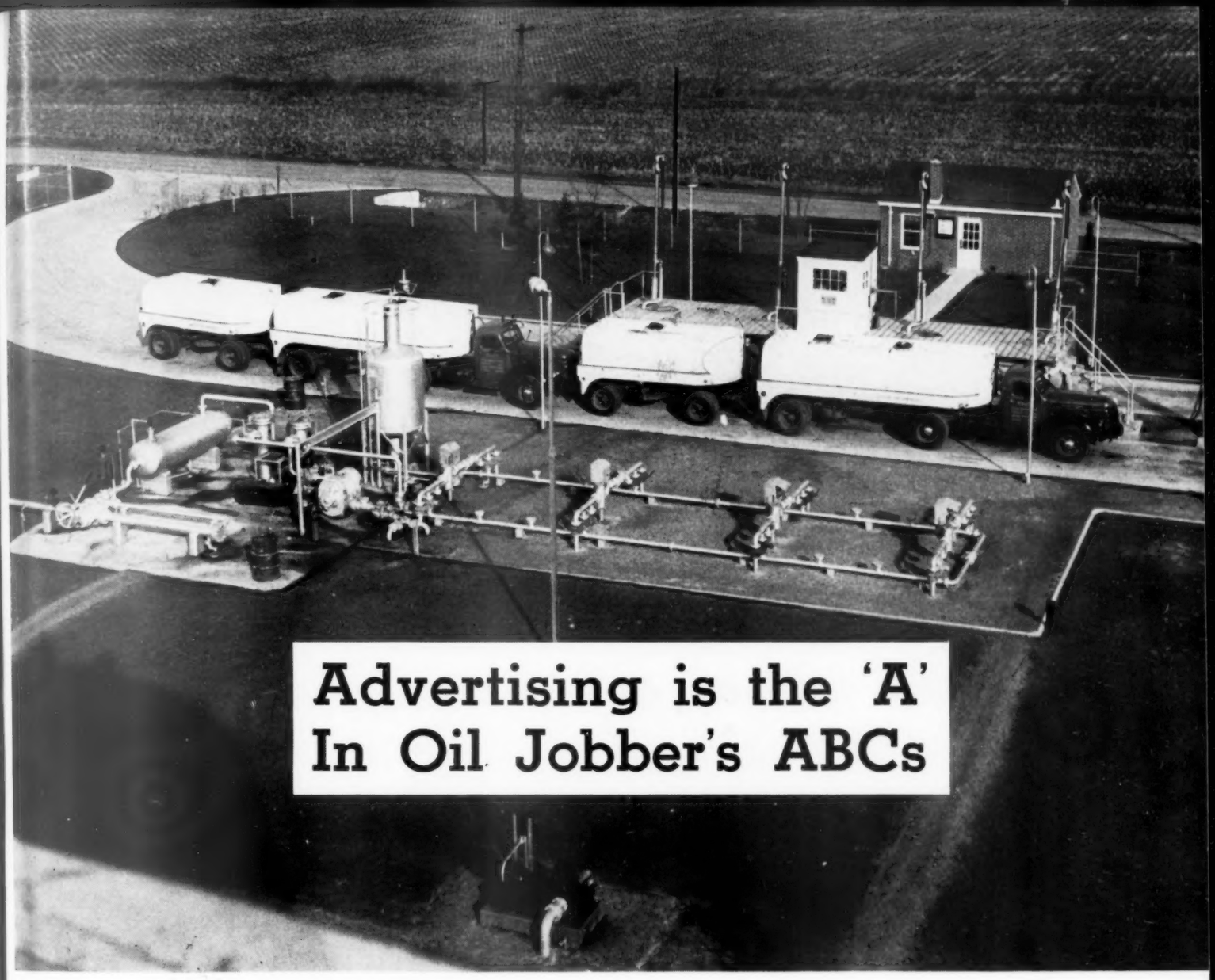


Advertising is the 'A' In Oil Jobber's ABCs

From this Columbus terminal, Rice Oil Co. deliveries are made by 6500-gal. transports

"This oil jobbing business", says "Bob" Shea, a fighting Irish Ohio jobber, "is like a 3-legged stool." The legs are ADVERTISING, BOOKKEEPING and CONTACT. "Poorly co-ordinated details, either by the supplier or marketer, will eventually result in a wobbly stool," says "Bob".

This article tells how this successful marketer takes care of 2 of these legs—Advertising and Contact. A future article will give facts on how he handles the large number of details of his big and growing business with only a few hours bookkeeping every afternoon.

"Bob" Shea, owner and manager of Rice Oil Co., Johnstown, Ohio, a nice little town of 900 about 30 miles out of Columbus on Route 62, believes that important points of the **ABCs** of operating a successful oil jobbing business are:

Advertising

Bookkeeping

Contact

"Bob" should know. For this 36-year old fighting Irishman worked his way up to the head of his company the hard way. He started working for Rice Oil Co. in 1928 as a service station helper. During the next 12 years he held about all the different jobs this pioneer jobbing company had to offer. The past several years he was secretary of the company.

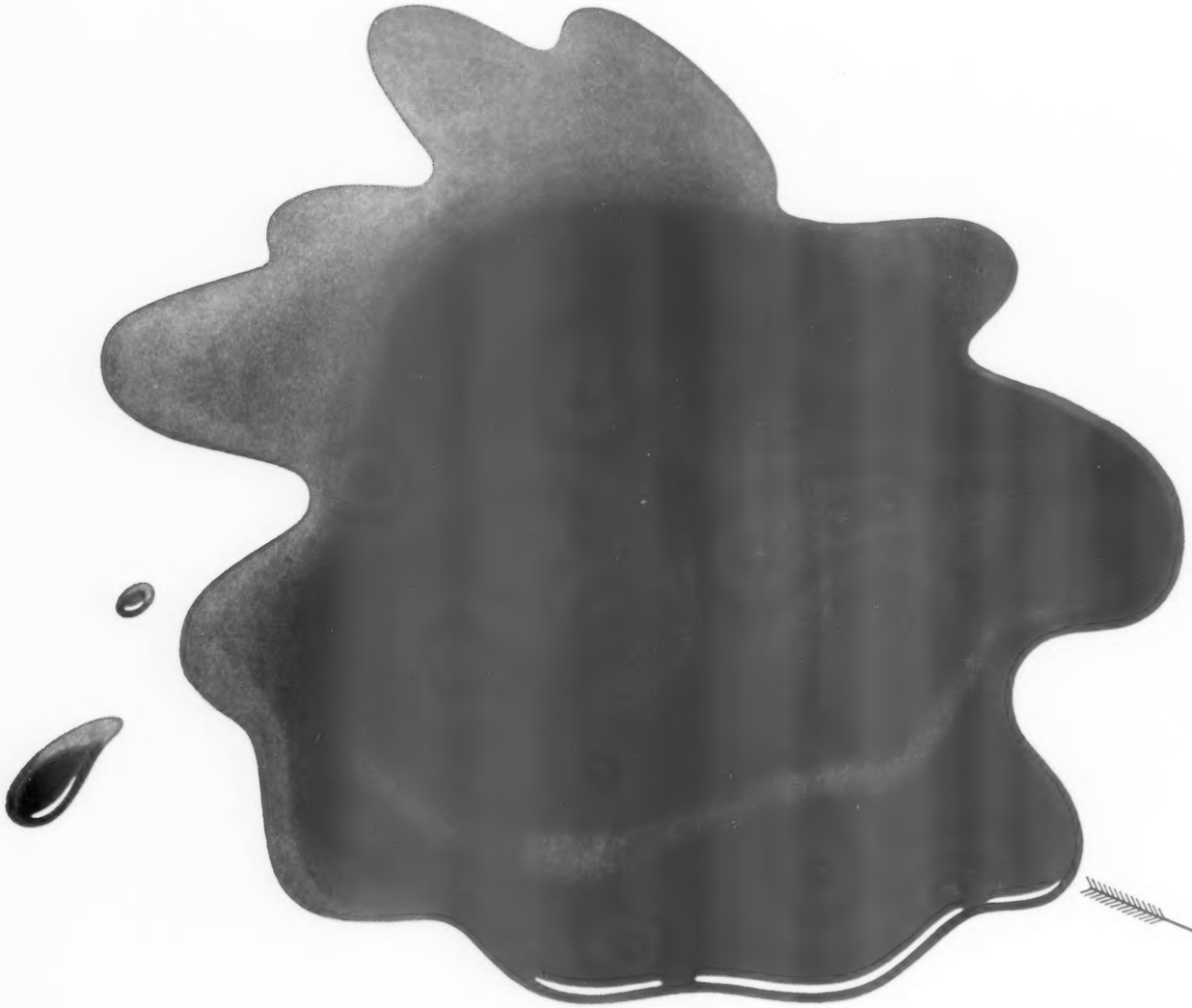
In February, 1941, D. G. Rice, pioneer oil jobber and founder of the company, decided to retire and give others a chance to enjoy the success that was his after 25 years of operation.

Mr. Rice started the company in 1916 in a small wooden shack on Main street. "Stock" consisted of a 50-gal. drum of gasoline and 2 five-gal. cans of motor oil. In selling gasoline, it was first poured through a chamois into a 5-gal. can, then put in the automobile tank. This was to prevent water from getting into the tank.

To-day the company operates in parts of 5 Ohio counties, serves 35 dealers and more than 600 farm accounts. This year the gasoline business is up 7%, and the motor oil business better than 33 1/3% over last year. The year will end with a gasoline gallonage of more than 1½ million, and close to 40,000 gal. of motor oil.

The business all comes from small towns and farms within a 25-mile radius of Johnstown. It is served by 4 trucks, with a total personnel of 4

Without Oil...*Neither Is Possible!*



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Alliance...for special lubricating oils for special purposes... aviation, Diesel, marine, tractor, motor, automobile, railroad, and industrial lubricants. United States and British Governments' Air, Naval and land forces are using Alliance lubricating oils.

OR WAR PLANES

L CORP.

Z A NEW YORK

"Bob" Shea, owner and manager of Rice Oil Co., Johnstown, Ohio

truck salesmen, 1 territory salesman, a pump mechanic, and Mrs. Shea who comes down to the office in the afternoon and takes care of the books.

Advertising Cuts Overhead

The secret of operating efficiently with such a small force, Mr. Shea will tell you, is to make advertising do a big part of the work. The company sets up a budget each year of ⅛ of a cent per gallon to localize the national advertising of the supplier. This money is spent in the form of newspaper advertising, road signs, slides in picture shows, sponsoring of bowling teams, co-operative advertising with dealers, novelties and good will builders. Neon signs are furnished the better dealers.

Good Will Advertising

In the good will advertising breakdown, one item would seem unusual in oil advertising. That item is hams. For many years every dealer of the Rice Oil Co. around Christmas time has received a large ham as regularly as the holiday season rolls around. The finest hams to be had are furnished. It is quite possible that these hams have plenty to do with the fact that practically the only dealers lost in the past several years have been dropped by the company rather than being taken away by competitors.

Naturally it would be impossible to give every farm customer a ham. But this end of the business is not overlooked in the good will advertising program. For every year the wives of the farm customers receive a practical household device.

One of these devices, which proved to be one of the most popular so far, was a dust pan. These pans had a long handle, and at the top was a device for pulling which opened the pan. Dust is swept in the pan, the pulling device released, which closes it, all without the necessity of bending over. These cost 27c each, including the company's imprint.

Other advertising novelties, some of which are bought from the supplier and others elsewhere, are book matches which carry the company's imprint, pencils, calendars, thermometers. During the summer months, 24-sheet posters are displayed, at this jobber's expense—except the paper which is furnished by the supplier. In addition, painted display boards are constantly being added whenever a good location is found, and the space bought economically.

Rates Country Newspapers High

A year 'round newspaper campaign is carried on in all of the small weekly papers throughout the territory. Some 10 papers are used, usually with 30-in. ads. Except on special occasions, mats furnished by the supplier are used, with an imprint at the bottom reading "Rice Oil Co., 'Bob' Shea, Owner and Manager, Johnstown, Ohio.". The rates are low in these papers, and Mr. Shea considers country newspaper advertising the best local medium for a distributor of nationally advertised products. He also rates "slide" advertising in picture shows very highly.

An unusual promotion angle that has developed in this farm territory is the desire of farm homes to receive copies of the supplier's house organ—*Shell Progress*. These are mailed to the dealers by the company. Farm people would see them and want one for themselves.

Mr. Shea was successful in selling his supplier on the idea of furnishing him a few extra copies of the house organ, which he distributes to some of his best farm accounts. A number of cases were cited by Mr. Shea where ladies on farms would call up and agree to buy products from him if he would get them that nice oil company magazine.

Monthly Conferences

The first Monday after the tenth of each month the entire Rice Oil Co. organization gets together to discuss the past month's operation and go over the advertising and sales plans for the following month. These are informal meetings, held at the homes of the various employes in rotation. They are on the order of a staff meeting of a large organization, and being informal, the men "let their hair down" and discuss things that would probably not be brought up in a more formal atmosphere.

Ideas Developed

Any new ideas that Mr. Shea has picked up from trade papers (he says he was "born and raised" on NPN, since it has been going to the company for more than 20 years) are discussed. New "dope" from the supplier is gone over. When some new suggested advertising or sales promotion comes up for discussion, often it is decided to have one dealer try it out before adopting it generally. If it works there, it is used in the entire territory. Each man is expected to come up with a new idea from time to time.

One of these ideas was presented by M. M. Dorsey, who has been a salesman for the company for 17 years. It was Mr. Dorsey's idea that more oil

Rice Oil Company's bulk plant in Johnstown, Ohio. These 4 trucks serve 35 dealers and 600 farm accounts more than 1½ million gals. of gasoline annually

A new idea for good "pump housekeeping" developed by Rice Oil Co. dealer. Two 5-qt. cans are welded together, a spindle top fastened in with a couple of nails. Result: a container for used paper windshield wipers and other small trash

could be sold to farmers if some kind of attractive point of sale display could be worked out for use at the general stores and smaller garages. So a special deal was worked out on 5 gallon cans.

Empty 5-gal. cans were purchased from the supplier at 55c each. Three of these cans were sold to the dealer at cost and filled with three grades of motor oil. A flat price was made on the filled can, which included the cost of the can. These were placed where they could be seen, and a sign made, reading "SPECIAL $--- including this handy farm utility can." This was tried out in one dealer's place and went over so well that since March it has been placed at 22 locations.

Since March, more than 40 drums of oil has been sold by this plan. And all of these 400 cans is plus business. The entire advertising cost to move these 20 extra drums amounted to the cost of the hand painted signs —less than $5.

Making a Good Oil Ratio

This jobber is getting an unusually large motor oil business in proportion to his gasoline gallonage by giving his customers considerably more than a sales talk on the quality of his products. He is spending his own good money for local advertising, for first class equipment and maintenance and in training his dealers to be good merchandisers. He is showing them that they can do a better selling job and make more money with his complete line of oils, greases and supplies rather than trying to sell products of many different companies.

This constant program of service, merchandising education and personal contact, backed by the supplier's national advertising campaign and this jobber's local sales promotion efforts—the sum total cost of which amounts to only a fraction of a cent per gallon —has resulted in one of nearest "ideal" motor oil and grease businesses to be found anywhere in the country. The ratio is now running better than 40 to 1.

"It's easy to do," says "Bob" Shea, "if you don't mind hard work and are not afraid to spend a few dollars."

C-O-N-T-A-C-T Spells BUSINESS

Next to advertising, this jobber believes that the best sales builder and "holder" is contact. In addition to the regular deliveries by the tank truck salesmen, Mr. Dorsey, the company's salesman must contact each dealer at least twice a month. In addition to that "Bob" Shea, makes it a point to see each of his dealers at least once a month. Usually he rides with the truck driver in making these contacts as he has found that his dealers, at any rate, feel that the "boss" must be a pretty good "guy" if he comes around on a truck instead of a high powered car.

In making these rounds, Shea has some very definite objectives. They are:

(a) Checking on the advertising

(b) Keeping collections in line

(c) Passing on merchandising ideas.

On the advertising, Mr. Shea has a few notes on things to check. The first is whether the material that has been delivered by the drivers or salesmen is properly displayed; whether proper use is being made of the company's pamphlets, booklets, charts and the like. Often he is able to make a helpful suggestion for a window display or for changing the products around where they will be better seen. Pumps are checked to see if they are clean and attractive, signs checked over, and if they are not found as they should be a note is made, and the maintenance man is given orders to get them in shape.

Collection 'Headaches' Cured

Collections are far from being a major worry of this jobber. The majority of the dealer accounts are on a "dump to dump" basis. They are started out with a full tank of gasoline, the next time the driver comes around he fills the tank and collects. The farm accounts are sold on a 30 day basis, and when they get past 60 days, Shea personally calls on them, and generally gets the money. He thinks it is just a lot of bunk that the average farmer is slow pay. "They can always dig up the money if they have to," he says. "With the average farmer 'times are always bad' if you listen to them. But if you let them know that you are going to get your money when it is due, they will generally make arrangements to get it somehow."

The truck drivers also are constantly on their toes to see that accounts on their routes are not overdue. In the company's office, is a blackboard with a list of the drivers, which is posted daily. On the 6th day of October this record was as follows:

DAILY RECORD OF CHARGE ACCOUNTS

Driver	No. of accounts to date	30 days old	60 days old	Accounts collected to date
Clif Brake	185	7	4	71
Ike Willson....	196	14	11	72
Dennie Troops..	152	6	0	75
Dean Smith....	80	3	3	25

This board is not discussed very often, as the record speaks for itself. But let one little mistake slip in, and the driver will be bellowing all over the lot in nothing flat. They really take the board seriously, and do what it takes to keep their accounts in current condition.

In making his contacts with dealers, it is always Bob Shea's policy to have something new in the way of merchandising to pass on to them. His supplier's contact man knows that he had better not even come in town without some new ideas for Bob. He is never satisfied to do things the way they used to be done. He looks on his suppliers to pass on modern merchandising ideas that can be used in the business. He looks on that as a vital part of his job as a cog in the wheel of distribution.

Constant Modernization Program

The Rice Oil Co., under the direction of "Bob" Shea has for several months been going through a modernization program. It is to be continued. A survey indicated that there were a large number of old model pumps at dealer stations. It was decided to replace these with modern equipment. But first, in order to keep from junking the old equipment, an intensive campaign was put on for new farm accounts.

This year almost 60 new farm accounts have been added and supplied with older model pumps from dealer locations, and the stations were equipped with the latest pumps. The company is to continue this program, and expects to go through a constant change-over of equipment by replacing dealer equipment with new material, and supplying farm accounts with first class, but not necessarily new equip-

"Home-made" barrel filling funnels are carried by all trucks. Saves time and wrestling with drums

Must you

INCREASE YOUR BULK R

NEPTUNE

LK PLANT CAPACITY?

WILL YOU DO IT by expanding your storage capacity or by increasing your rate of throughput? Whichever method you favor—by reason of your relation to supply sources and market—you will find that certain factors invariably govern MAXIMUM capacity for your plant. Among these factors is METERING . . . which both influences speed of throughput, and helps to hold your storage and stock handling losses to a minimum.

KANSAS JOBBERS PLAN PLANT EXPANSIONS
(NPN OCT 15) Kansas Oil Men's Ass'n reported on Oct 11 that 80% of its members will increase their bulk plant capacities and about 60% will buy trucks - mostly the larger sized ones - during the next twelve months.
From NPN's War Defense Bulletin

Plant Expansion Off on the Right Foot

According to the news, many bulk plant capacities are to be increased.

Whether such capacity is to be increased by actual plant expansion or simply by enlarging present storage facilities, a real opportunity is presented.

Now is the time to introduce methods by which expanded plant facilities will be streamlined to handle optimum throughput.

This maximum plant capacity is achieved through a combined engineering and stock-control plan. Such a tested plan is described in the "RED SEAL Meter Master System and Stock Record Control Plan." (Your nearest Neptune office will give you full particulars. Simply ask. No obligation.)

Metering plays an important part. It prevents losses or exposes leaks that can be remedied . . . often hidden leaks or wasteful stock handling that may represent a surprisingly large proportion of your "unaccounted-for" gallonage. Metering helps to speed throughput. It also sets up an accurate perpetual stock inventory and sales record . . . facilitates bookkeeping and tax computaticns . . . establishes plant-control and better profit-control.

For example, Red Seal metered bulk plants in every section of the country have reported that it is no trick to hold stock losses below ½ of 1%.

Where Speed of Throughput Is Essential

Situated in Brooklyn is a bulk plant (handling light fuel oils and kerosene), which has a daily throughput capacity of a million gallons, yet a storage tank capacity of only 500,000 gallons. It is a good example of the compact type plant, found increasingly in large cities, where modern design and equipment emphasize rate of throughput instead of big-volume storage. A battery of Red Seal ticket-printing meters services the loading-racks, for rapid loading. Such details as yard routing for smooth in-and-out traffic, are highly perfected.

In this particular case, a nearby marine terminal assures a continuous schedule of barge unloadings at the bulk plant—adequate receivals for maintaining throughput. But even where greater storage facilities are necessary or space readily is available, plant operation is improved by metering. Stock losses are cut substantially and customer-goodwill insured.

Metering can be applied profitably, whether or not you plan to extend your bulk storage space.

Whatever the plant size, modern meters should be standard equipment if plant efficiency and an increased profit margin are considerations.

What About Your Trucks?

Advantages in plant capacity may be canceled, wholly or in part, by inefficient distribution methods.

American Petroleum Institute discussions call attention to the need for transport or retail delivery tank trucks designed to meet new conditions or individual requirements. Combination units, convertible units with demountable tanks, etc., are becoming specialized manufactures. Discharge mechanism is given intensive study. Climatic conditions of use are considered.

The advantage of the *metered* truck is fast gaining recognition throughout the country. Once employed, its use is seldom if ever discarded. It completes the marketer's metering job of "accounting for every gallon." Cuts delivery costs . . . instills customer-confidence.

"Couldn't do without delivery tank truck meters—and our customers wouldn't let us if we could," is the sum and substance of many a Red Seal user's testimony. (See RED SEAL Bulletin No. 591. Copies obtainable upon your request.)

NEPTUNE METER COMPANY — Main Office: 50 West 50th St., New York. Branch offices in Atlanta, Boston, Chicago, Dallas, Denver, Kansas City (Mo.), Los Angeles, Louisville, Philadelphia, Portland (Ore.), San Francisco, Toronto.

E RED SEAL METERS

NEPTUNE RED SEAL METER CO.

Gasoline Dispensing Pumps • Meters for: Barge and Tank Car Unloadings • Storage Transfers • Loading Racks • Delivery Tank Trucks

1782

ment. $3000 worth of new equipment was purchased in the last 9 months.

Plant Modernization

The company's bulk plant is also on the company's time-table of modernization. The bulk plant now consists of 100,000-gal. storage—3-20,000—2-12,000 and 1-16,000-gal. tanks. All withdrawals are metered. Incoming deliveries are made 2 and 3 times weekly by 6500 transport trucks. Usually 2 truck loads are delivered at one time. These trucks, operated by private carriers, are also metered. The gasoline comes from the supplier's terminal in Columbus, and is received there by pipe line from Wood River, Ill.

Recently Rice Oil Co. acquired additional property on the side and front of this gasoline bulk plant, and is now in the process of converting an old dairy and warehouse into a modern warehouse, garage and equipment repair shop. At present, oil, grease and other supplies are scattered all over town in storage warehouses. Oil, grease, alcohol and the like is delivered in box cars. The new setup will centralize all the delivery and storage facilities and will have the entire organization at the plant, with the exception of the downtown office. The new plant is to be completely fenced, floodlighted and brought up to 1942 standards. The plant is already equipped with vapor saving devices.

The company's four delivery trucks; 1-1000, 1-678, 1-665 and 1-620 gal. capacity, and the quarter ton pick up truck, will be serviced from the remodeled plant. One of the regular services these trucks will receive will be regular cleaning of their down-draft air cleaners. Mr. Shea discovered that an additional 2 miles per gallon could be secured from his trucks by regular cleaning of these devices. A standard air cleaning machine is used for this service. The outfit only cost $27.50, and has paid for itself over and over again, according to Mr. Shea.

The smiling gentleman on the right is Cleveland Shell Division Jobber Representative Paul B. Caldwell. Mr. Caldwell, who is being transferred to Minneapolis, is given a matched and registered set of Burke Golf Clubs by "Bob" Shea, owner and manager of Rice Oil Co., Johnstown, Ohio. Mr. Shea presented this set of clubs to Caldwell in appreciation of his co-operation in developing this jobbing company to one of the most successful in the Mid-West. The little fellow is "Little Bobby Shea", 5 year old son of Mr. Shea

Bookkeeping System Simplified

All of the details of an operation of this kind must take a tremendous amount of bookkeeping and detail work, one would think. But far from it. Mrs. Shea comes down to the office in the afternoon, sends "Bob" out to call on the trade, and the next morning when he comes to work he can, by referring to an unusually small number of records, give you the answer to any question—so far as records are concerned—regarding the company's operations.

The system is so complete and so simple that it is almost unbelievable. It was worked out by Mr. Shea, who before getting into the oil business was a traveling auditor for one of the large rubber companies. His supplier oil company that had spent much time, money and effort in developing an ideal accounting system for a jobber operation, was interested to learn that the company's system was almost identical to the one that was already in use by this jobber.

Tells Advantages of Asphalt

Digest of a paper by W. R. Macatee, managing director of the Asphalt Institute, on "The Need for Scientific Design on Runway Pavement on Military Flying Fields" has been released by Western Petroleum Refiners Assn. Digest states that asphalt runways can provide greater safety and higher skid-resistant qualities than any other type pavement.

Turn Door Handles Down

Inside door handles on trucks and passenger cars that point toward the rear are likely to catch the driver's sleeve and cause an accident on a sharp curve, reasons one oil company in Texas. So, to take an extra precaution in the name of safety, the company sees that inside door handles on all of its vehicles are turned downward. It only takes about 3 minutes to make this change on the average car.

Since 1933, the number of domestic oil burners in use in U. S. has increased from 839,070 to 2,162,820.

$1 Out of $8 Taxes Is Paid by Motorist

Motorists now pay one out of every eight tax dollars collected by all units of government. During 1940, $1,328,000,000 in taxes were collected by the states through these levies. The federal government under the new 1941 Revenue Act will collect $750,000,000 annually in special automotive taxes although no new taxes were levied on petroleum products. New York was the first state to impose a motor vehicle registration fee in 1901, and Oregon was first to tax gasoline. List of total amount of taxes and motor-vehicle fees collected since beginning of these levies follows:

Accumulated State Gasoline Taxes and Motor Vehicle Fees Collected Since First Levy Through 1940

	Gasoline Tax (add 000)	Motor Vehicle Fees* (add 000)	Gasoline Tax and Motor Vehicle Fees Combined (add 000)
Ala.	$143,862	$67,775	$211,637
Ariz.	48,598	15,731	64,329
Ark.	117,776	58,795	176,571
Calif.	594,594	300,947	895,541
Colo.	94,764	44,388	139,152
Conn.	95,221	140,717	235,938
Dela.	20,944	19,565	40,509
D. C.	31,546	18,263	49,809
Fla.	267,772	98,796	366,568
Ga.	223,726	58,670	282,396
Ida.	45,286	35,224	80,510
Ill.	377,142	346,112	723,254
Ind.	281,157	144,891	426,048
Ia.	163,155	283,181	401,336
Kans.	124,957	101,105	226,062
Ky.	149,840	87,919	237,759
La.	153,483	78,919	232,402
Me.	66,891	60,187	127,078
Md.	118,976	82,436	201,412
Mass.	203,252	173,539	376,791
Mich.	344,562	376,200	720,762
Minn.	175,717	180,273	355,990
Miss.	117,690	46,257	163,947
Mo.	145,014	171,936	316,950
Mont.	51,460	26,576	78,036
Nebr.	128,985	66,487	195,472
Nev.	13,660	6,936	20,596
N. H.	40,339	44,720	85,059
N. J.	229,365	301,774	531,139
N. M.	43,345	20,120	63,465
N. Y.	590,428	758,912	1,349,340
N. C.	260,056	131,099	391,155
N. D.	33,286	31,058	64,344
O.	559,776	354,021	913,797
Okla.	177,343	111,687	289,030
Ore.	116,084	109,941	226,025
Pa.	595,589	585,067	1,180,656
R. I.	32,767	46,067	78,834
S. C.	131,587	42,443	174,030
S. D.	56,778	44,845	101,623
Tenn.	198,862	76,808	275,670
Tex.	467,630	301,154	768,784
Utah	40,446	19,453	59,899
Vt.	29,260	41,415	70,675
Va.	194,544	110,699	305,243
Wash.	168,802	101,157	269,959
W. Va.	98,052	87,826	185,878
Wisc.	213,335	219,196	432,531
Wyo.	26,584	12,865	39,449
	$8,604,288	$6,599,152	$15,203,440

*Embraces collections since 1910 only, since figures for previous years are not available. Although most states collected registration fees before 1910, the rates were adjusted to yield only administrative costs and consequently were relatively low. Collections before 1910, therefore, were negligible. Includes special motor carrier tax collections.

Motorists Pay 'Road' Taxes But Big Lump is Diverted

Motorists paid $2,130,147,000 in state and local taxes on their motor vehicles during 1940, National Highway Users Conference reported last week. Figure includes $1,374,514,000 for highway purposes—of which $196,579,000 was diverted away from roads—and $755,613,000 for general governmental purposes.

AD1 TWS PAID SHREVEPORT LA

EVERY OIL COMPANY= U S A=

RETEL: PLENTY OF 10-W AND 20-W EIGHTY SERIES PREMIUM WINTER OILS AVAILABLE. WE'VE ALMOST DOUBLED OUR REFINERY THROUGH-PUT. EIGHTY SERIES WINTER OILS ARE STRAIGHT-RUN VACUUM DISTILLED FROM SELECT WAXFREE MID-CONTINENT CRUDE. HIGH V.I.. HIGH FLASH AND FIRE, EXTREMELY LOW POUR-POINT. NO SHORTAGE OF CARS IF YOU ORDER NOW=

BAYOU STATE OIL CORPORATION..

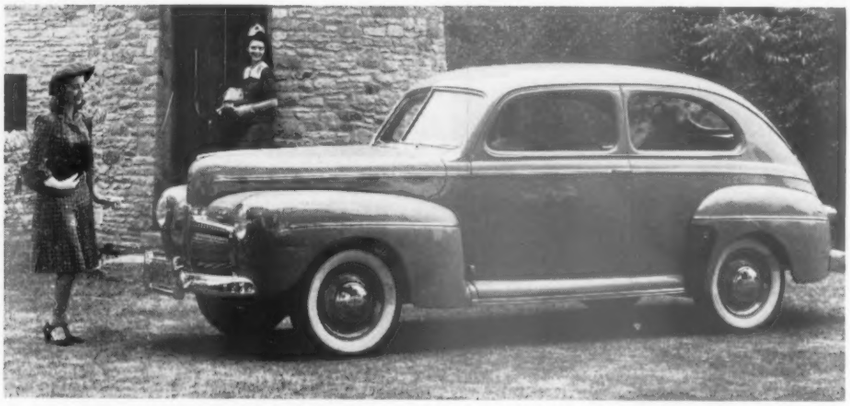
PRODUCERS REFINERS MARKETERS

BAYOU STATE
OIL CORPORATION
SHREVEPORT, LOUISIANA

Servicing the 1942 Cars For Their Conservation

Oil Jobbers must assume responsibility for making certain that their own and their dealers' stations receive the proper lubricants, accessories, information and other aids necessary in servicing the 1942 automobiles, efficiently and reliably. Because of curtailed production, owners of new cars will want more than ever to keep them looking better and lasting longer.

To inform the jobber quickly and accurately about the changes in the new cars over the 1941 models, NPN has prepared a series of articles of which this is the ninth.



1942 FORD

SUMMARY

- Mechanical changes resulting in additional power, economy and better cooling system, are some of the claims on the 1942 Ford line.
- A direct drive for the oil pump is one of the features of the new Ford Six. The new type gear pump is built into the front main bearing cap. The oil pump screen is integral with the drain plug, and thus permits easy cleaning of the screen.

Capacities

	Six	V-8 DeLuxe and Super DeLuxe
Cooling system, qts.	15	22
Fuel tank, gal.	17	17
Crankcase, qts.	5	5
Transmission, pts.	2¾	2¾
Differential, pts.	2½	2½

On 1941 V-8 (DeLuxe and Super) the cooling system is 26¼ qts.

Oil and Grease Recommendations

MOTOR OIL:

Prevailing Temperature Range
Temperature above 32° F. . . . SAE 30
Temperature above 10° F. . . SAE 20 or 20-W
Temperature above —10° F. . SAE 10 or 10-W
Lower temperatures . . . . . Dilute 10-W with 10% kerosine

(*No change on* 1941 *recommendations*)

Change Periods:

Company recommends change every 2000 miles after initial change at 300 miles.

(*No changes from* 1941)

GEAR LUBRICANTS:

Transmission:

SAE mild extreme pressure gear oil No. 80 recommended for winter, and SAE No. 90 recommended for summer.

(*No change from* 1941 *recommendations*)

Change Period:

Company recommends that transmission be drained, flushed and refilled with mild extreme pressure gear oil —winter SAE 80, Summer SAE 90—each fall and spring, or every 5000 miles (whichever occurs first).

(*No change from* 1941 *recommendations*)

Differential Lubricant:

SAE 90 mild extreme pressure gear oil for winter; below zero—SAE 80. (In steering gear SAE 90 is recommended for all seasons). SAE 140 is recommended for summer.

(*No change from* 1941 *recommendations*)

Change Period:

Each fall and spring, or every 5000 miles (whichever occurs first).

(*Some change periods recommended for* 1941 *models*)

OIL FILTER:

Oil filters are special equipment. Plug holes are provided for accessory installation.

Accessories to be Sold or Serviced

AIR CLEANER:

(*Same change periods recommended*

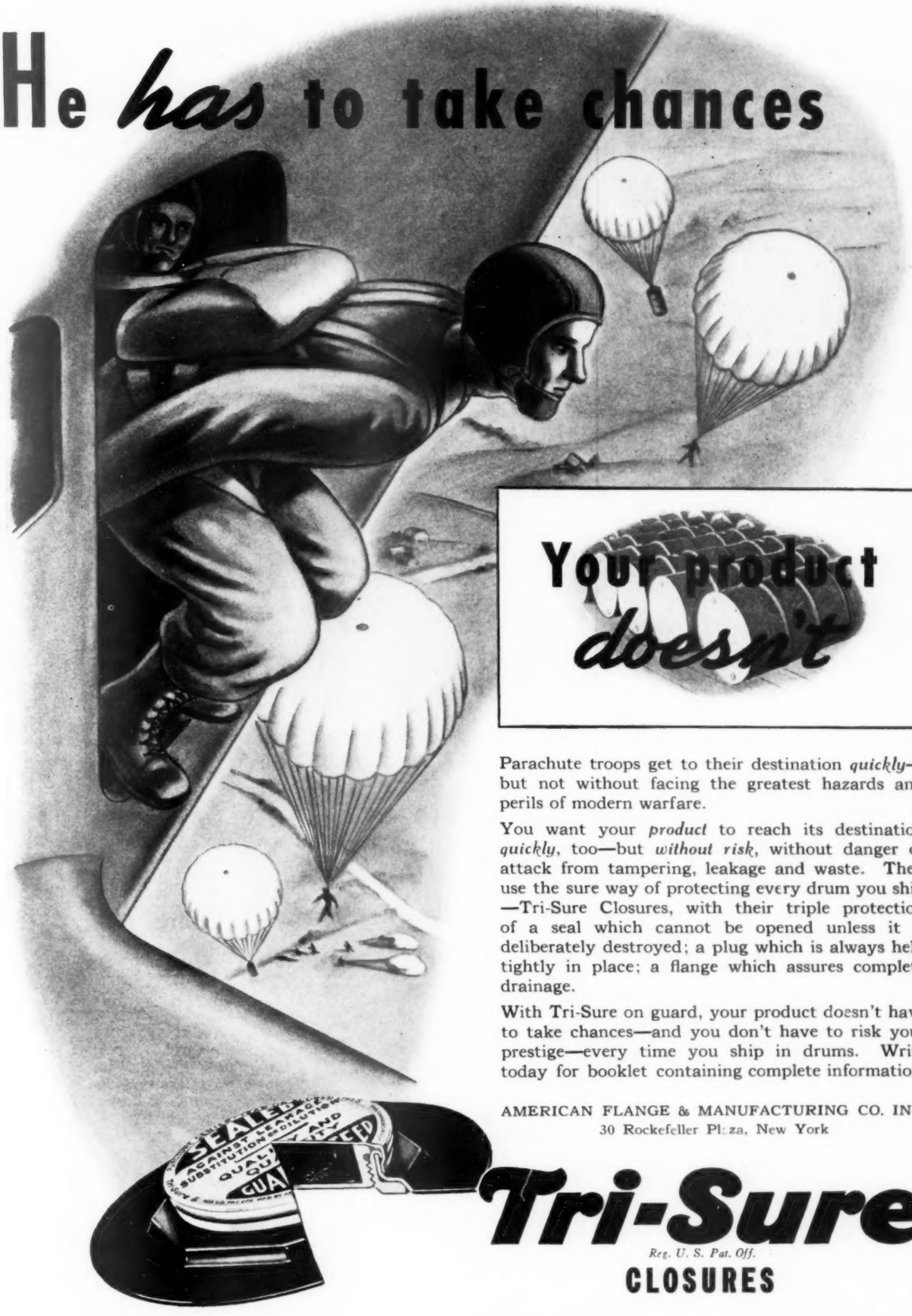
These cars are equipped with an engine ventilator screen in oil filler cap. The company recommends that this be checked frequently to see that it does not become obstructed with dust.

Company states that carburetor air cleaner should be frequently checked to see that it does not become obstructed with dust, particularly when cars are operated over unpaved roads. They state that in excessively dusty operation an oil type air cleaner should be used.

TIRE PRESSURES AND SIZES:

The company states that the tires should be inflated to 28 lbs. and at no

He *has* to take chances



Your product *doesn't*

Parachute troops get to their destination *quickly*—but not without facing the greatest hazards and perils of modern warfare.

You want your *product* to reach its destination *quickly*, too—but *without risk*, without danger of attack from tampering, leakage and waste. Then use the sure way of protecting every drum you ship —Tri-Sure Closures, with their triple protection of a seal which cannot be opened unless it is deliberately destroyed; a plug which is always held tightly in place; a flange which assures complete drainage.

With Tri-Sure on guard, your product doesn't have to take chances—and you don't have to risk your prestige—every time you ship in drums. Write today for booklet containing complete information.

AMERICAN FLANGE & MANUFACTURING CO. INC.
30 Rockefeller Plaza, New York

Tri-Sure

Reg. U. S. Pat. Off.

CLOSURES

time should be allowed to drop below 25 lbs.

Passenger car tires are size 6:00 x 16.

LIGHT BULB SIZES:

	C.P.	Mazda No.
Headlight	Sealed beam	4030
Parking	3	63
License		
Dome*		
Luggage		
Tail and Stop	21-3	1154
Cluster-Instr.	1½	55
Speedometer		
Clock**		
Hi Beam Indicator	1	51
Ignition Light		

*No dome light on Ford Standard.
**On Super Deluxe only.

General Servicing Data

HOW TO GET UNDER THE HOOD:

The hood release knob is located directly below the instrument panel to the left of the steering column. After releasing the hood lock by pulling out the release knob, it is necessary to push in on the secondary catch beneath the hood before it can be raised.

TYPE SHOCK ABSORBER:

The shock absorbers are hydraulic, double acting type, and are adjustable. Company states that it is important to keep them filled with shock absorber fluid; that they should be checked at least twice a year.

SPARK PLUGS:

Company recommends occasional examination and cleaning of plugs. Recommended gap setting .027".

FUSES:

All lighting circuits are protected by circuit breakers. (2 used). In the event of a short circuit, this device alternately opens and closes the circuit

and gives warning of the trouble by causing the lights to flash on and off.

BATTERY:

The battery is located in the engine compartment on the left hand side in the Ford Six and in the Ford Eight is located in the engine compartment on the right hand side.

It is 6 volts, 17 plates and has a capacity of 120 amp. hours.

1942 Ford Accessories

(As listed by the company)

Radio
Hot air heater-defroster
Auxiliary underseat hot water heater
Seat covers
Spot light
Road lamps
Rear fender shields
Rustless steel wheel bands
Oil filter
Governor
Oil bath air cleaner (heavy duty)
Oil bath air cleaner (hat type)
Front bumper center guard
Bumper end guards
Side mirrors
License plate frames
Visor vanity mirror
Gas tank locking cap
Electric clock
Bumper end guards
Rear bumper center guards.

1942 MERCURY

SUMMARY

• While the company cites numerous mechanical improvements for the 1942 Mercury, such as higher power weight ratio, a "Liquamatic" drive at extra cost, there are few changes so far as lubrication capacities and recommendations are concerned.

• The cars have longer chassis springs, revised interleaf lubrication and new rubber bushings in the spring eyes.

• The company features a broad selection of accessories at extra cost including: Radio with foot control and touch-bar tuning; hot-water and hot-air heater-defrosters; auxiliary underseat heater; seat covers; spotlights; road lamps; turn direction indicator; and bright metal rims.

Capacities

Cooling system, qts.	22
Fuel tank, gal.	17
Crankcase, qts.	5
Transmission, pts.	2.75
Differential, pts.	2.5

Change:

Cooling system is changed from 25½ qts. on the 1941 models.

(No other changes from 1941)

Oil and Grease Recommendations

MOTOR OIL:

Anticipated temperature	Grade
Above 32° F.	SAE 30
Above 10° F.	SAE 20 or 20-W
Above minus 10° F.	10-W
Lower temperatures	10-W plus 10% Kerosine

(No changes from 1941)

Change Periods:

The company states that after operating car 300 miles, the oil should be drained from the engine. They recommend draining at 2000-mile intervals thereafter.

(Same change periods recommended for 1941 *models)*

GEAR LUBRICANTS:

Transmission

Mild extreme pressure gear oil, SAE 80 recommended for winter and SAE 90 for summer.

(No change from 1941 *recommendations)*

Change Period:

Change is recommended by the company each fall and spring, or every 5000 miles (whichever occurs first).

(Same recommendations on 1941 *models)*

Differential Lubricant:

Mild extreme pressure gear oil, SAE 90 for winter and SAE 140 for summer is recommended by the company.

(No change from 1941)

Change Period:

Company recommends that each fall and spring, lubricant be changed. On a mileage basis they recommend change every 5000 miles, and specify that change should be made at whichever period occurs first.

Accessories to be Sold or Serviced

OIL FILTER:

This is special equipment. Plug holes are provided for installation.

AIR CLEANER:

The air cleaner is attached to the carburetor air intake. The company recommends periodical cleaning, depending upon the condition of the roads over which the car is operated. To clean: remove top cover and filter unit. Wash filter unit in gasoline, dry thoroughly, then submerge in a good grade of engine oil and allow to drip dry before reinstalling. Caution is given not to oil the felt in top cover.

The company states that cars which are operated in dusty territories, or over unpaved roads, should be equipped with an oil bath air cleaner.

TIRE PRESSURES AND SIZES:

Size is 6:50 x 15. Recommended pres-

One of the intermediate models in the great line of Mack trucks

MACK TRUCKS

One to 45 Tons and all "Heavy Duty". Gasoline or Diesel.

Chassis prices now start at $625.

sure is 24 lbs. on both front and rear tires.

LIGHT BULB SIZES:

	Mazda No.
Headlight	Sealed beam unit
Parking, license and trunk lights	63
Tail and stop lights	1154
Instrument panel lights	55
Dome light	63

General Servicing Data

HOW TO GET UNDER THE HOOD:
The hood latch release knob is located on lower part of instrument panel, at extreme left.

TYPE SHOCK ABSORBER:
Shock absorbers are of the double acting hydraulic type and are adjustable for resistance. The company recommends that every 5000 miles they be checked for sufficient fluid.

FUSES:
The lighting system is protected by a circuit breaker located on the dash under the cowl. A 3 amp. fuse in the back of the clock is provided for its electrical protection.

SPARK PLUGS:
The company recommends occasional examination and cleaning of spark plugs. Recommended gap setting is .027 in.

BATTERY:
The battery is located on the forward side of the dash in the engine compartment. It is 6 volts, 17 plates, and 120 amp. hours capacity.

LIQUAMATIC DRIVE:
(Extra Equipment)
The Liquamatic drive which combines a liquid flywheel or coupling with an automatic transmission is extra equipment. The capacity of the liquid coupling is 10½ pts. of 10-W oil. The company advises that oil changes are unnecessary, but that it is advisable to check the oil level should there be any indication of excessive slippage.

1942 LINCOLNS

SUMMARY

• Few changes affecting lubrication and oil service on the 1942 Lincolns were made. Oil and grease recommendations are substantially the same as 1941 models, as are the recommended change periods.

• Fifteen-inch wheels have been adopted for all cars.

• Quick identification of the Lincoln line may be made by noting the elimination on all models of door handles. Flush-type push-button latch controls both inside and out are used.

Capacities

Cooling system, qts.	27
Fuel tank, gal.	19½
Crankcase, qts.	5
Transmission, pts.	2¾
Transmission, overdrive, pts.	1
Differential, pts.	4

(*No changes from* 1941)

Oil and Grease Recommendations

MOTOR OIL:

Anticipated temperature	Grade
Above 32° F.	SAE 30
Above 10° F.	SAE-20 or 20-W
Above −10° F.	10-W
Lower temperatures	10-W plus 10% kerosine

(*No changes from* 1941)

Change period:
Company states that after running new car 300 miles, the oil should be drained from the engine and refilled with proper grade of oil. Recommendation is made that oil be added between oil changes as individual engine requires, and that crankcase be drained and fresh oil added every 5000 miles.

(*No change from* 1941)

GEAR LUBRICANTS:
Transmission:
Company recommends SAE 80 gear oil for winter; SAE 90 for summer.

(*No change from* 1941)

Change Period:
Each fall and spring, or every 5000 miles (whichever occurs first).
(*Same change period for* 1941 *models*)

Differential:
Hypoid type gear oil SAE 90 E. P. for summer and winter, except for temperature below −10° F., when hypoid type gear oil SAE 80 E. P. is recommended.

Change Period:
Each fall and spring, or every 5000 miles (whichever occurs first).
(*Same change period for* 1941 *models*)

Accessories to be Sold or Serviced

OIL FILTER:
The company advises that the oil cleaner, which is standard equipment, requires no other attention than replacing filter cartridge every 10,000 miles.

AIR CLEANER:
The air cleaner unit is an oil bath type, and the company recommends periodic cleaning, depending upon the condition of the roads over which the car is operated. To clean: Remove top section of the cleaner, clean lower bowl and wash filter with kerosine and drain. Fill to the level indicated on the inside of the bowl with 1 pt. SAE 40 engine oil for temperatures above freezing and 20-W oil below freezing. Note—The same procedure applies to the cleaner on the Lincoln Continental except the removable section is at the bottom.

TIRE PRESSURES AND SIZES:
The company states that the pressure recommended by the tire manufacturer is 26 lbs. for both front and rear of the Lincoln Zephyr and Lincoln Continental models. For Lincoln Custom models the recommended pressures are 27 lbs. front and 33 lbs. rear.
Lincoln Zephyr and Lincoln Continental tire size, 7:00 x 15, 4-ply. Lincoln Custom tire size 7:00 x 15, 6-ply.

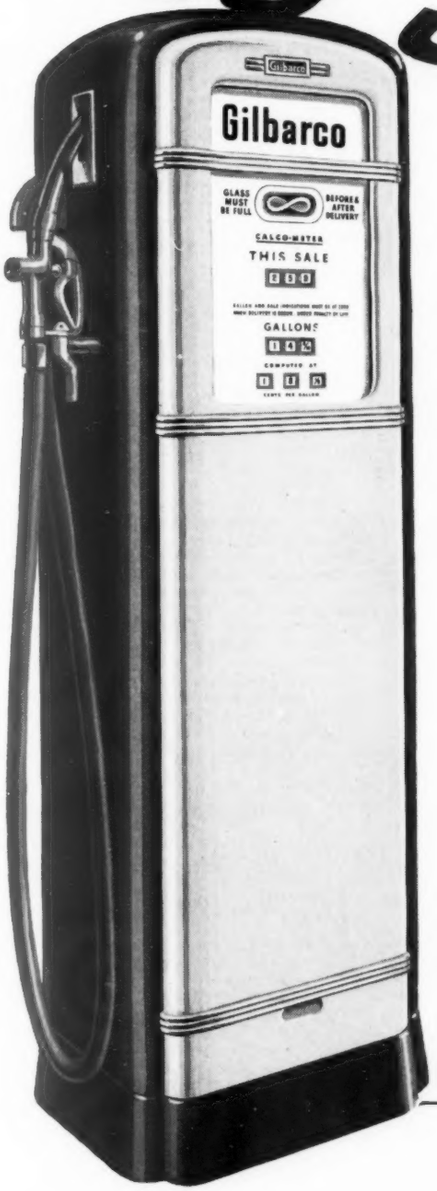
General Servicing Data

HOW TO GET UNDER THE HOOD:
The hood lock is located at the extreme lower left of the instrument panel.

TYPE SHOCK ABSORBER:
Shock absorbers are of the double acting hydraulic type and are adjustable for resistance. The company recom-

Gilbert & Barker is producing for the Army and Navy precision materiel for National Defense purposes, as well as supplying the Gilbarco products you know. These regular Gilbarco products continue to be available to our customers.

A BIG STEP...



TOWARD BIGGER VOLUME

MANY a service station operator has been the victim of a sickening feeling of dismay, as he sees his trade slowly deserting him... If he'd stop to analyze the situation, he'd realize that his old customers, and thousands of new motorists who take to the road each year, are gravitating to the *newer*, more *modern-looking* stations... the stations that are getting not only their *own* share of the traffic, but *his* too!

A new CALCO-METER "96" will help correct this loss of business 'cause that's the pump people are accustomed to seeing in new, modern, streamlined stations. The CALCO-METER "96" is engineered to handle volume. Gruelling tests under the most exacting conditions have demonstrated the CALCO-METER "96" the pump with the "*Million-Gallon*" dependability. This is positive proof of how CALCO-METER "96" increases your profits through cutting your servicing costs. Write for *Bulletin 96* today... and take the first important step toward stepping up your sales!

CALCO-METER 96

THE MILLION-GALLON PUMP

GILBERT & BARKER MANUFACTURING COMPANY
Springfield, Mass. Toronto, Ontario, Canada

mends that every 5000 miles all instruments should be checked for sufficient fluid. They also recommend seasonal adjustment on these units and the addition of fluid.

SPARK PLUGS:

Thread diameter is 14 mm. The company recommends setting of points with gap of .26 to .030, with .027 preferred. They recommend occasional examination and cleaning.

FUSES:

A 3 amp. fuse, located in the housing in the wire leading to the clock, is provided for electrical protection of that unit. A 15 amp. radio fuse is located in connector in power lead.
Other circuits are protected by circuit breakers.

BATTERY:

The battery is located on the forward side of the dash in the engine compartment. It is 6 volts, 17 plates and 120 amp. hours capacity.

Company recommends that every 2 weeks the battery solution be checked to see that the level is maintained above top of the plates.

Oil Equipment Supply Houses Get A-8 Priority Rating

Following is complete text of order; see also story on page 11.

OFFICE OF PRODUCTION MANAGEMENT
PRIORITIES DIVISION
PREFERENCE RATING ORDER NO. P-83
MATERIAL STOCKED BY SUPPLY HOUSES FOR DISTRIBUTION TO THE PETROLEUM INDUSTRY

To:

Name of Supply House .....

Address .....

Serial No. .....

PREFERENCE RATING ORDER. For the purpose of facilitating the acquisition of Material to be held for distribution to Persons engaged in the Production, Transportation, Refining and Marketing of Petroleum, a preference rating is hereby assigned to deliveries to the above-named Supply House and to deliveries to his Suppliers, upon the following terms:

(a) **Definitions.**

(1) "Supply House" means the specific person to whom this Order is addressed above.

(2) "Petroleum" means petroleum, petroleum products, and associated hydrocarbons including but not limited to natural gas.

(3) "Production" means the discovery, development, and depletion of petroleum pools, including without limitation the operation of cycling plants and plants for the extraction of natural gasoline and associated hydrocarbons.

(4) "Refining" means the operation of a plant or plants, other than those specified in subparagraph (3), for the production of finished or unfinished petroleum products (including but not limited to hydrocarbon oils or gases).

(5) "Transportation" means the operation of all petroleum terminal and terminal storage facilities and the operation of all pipe lines and gathering systems for the transportation of petroleum from facilities where petroleum is first gauged to any refining or local distribution facility and from any refining facility to any marketing or local distribution facility, except that in no case shall transportation include distribution of natural gas by means of local distribution facilities.

(6) "Marketing" means the operation of all facilities, other than those specified in subparagraph (5), for the distribution of petroleum products (not including natural gas) to service stations or to consumers, including without limitation service stations, substations, bulk plants, warehouses, and wholesale depots.

(7) "Sub-Supplier" means any person with whom a contract or purchase order has been placed for delivery:

(i) To a Supply House, of Material which has been specifically authorized for rating on Form PD-82 (a).

(ii) To another Sub-Supplier, of Material which will be physically or chemically incorporated into Material to be delivered to a Supply House under a rating authorized pursuant to this Order.

(8) "Material" means any commodity, equipment, accessories, parts, assemblies or products of any kind.

(b) **Assignment of Preference Rating.** Preference Rating A-8 is hereby assigned:

(1) to deliveries to the Supply House of those quantities of Material which may be specifically authorized for rating on Form PD-82(a) by the Director of Priorities, and

(2) to deliveries to any Sub-Supplier, of Material which will be physically or chemically incorporated into Material to be delivered to the Supply House under a rating authorized pursuant to this Order.

(c) **Persons Entitled to Apply Preference Ratings.** The Preference rating hereby assigned may be applied, in the manner and to the extent hereby authorized by

(1) the Supply House, and

(2) any Sub-Supplier who has been furnished with a signed copy of this Order in the manner specified in paragraph (e).

(d) **Restrictions on Use of Rating.**

(1) **Restrictions on Supply House.** The Supply House may apply the preference rating only to those quantities and kinds of Material specifically authorized for rating by the Director of Priorities on Form PD-82(a).

(2) **Restrictions on Sub-Supplier.** No Sub-Supplier may apply said rating:

(i) unless the Material to be delivered to him is itself required to enable him to make a rated delivery to the Supply House or to another Sub-Supplier; **Provided,** that no delivery of Material to such Sub-Supplier shall be deemed to be required unless the Sub-Supplier cannot make his rated deliveries and still retain a minimum practicable working inventory;

(ii) to obtain deliveries greater in quantity or on dates earlier than required for delivery on schedule of the Material rated under this Order;

(iii) to obtain deliveries of Material which will not be physically or chemically incorporated into Material the delivery of which to the Supply House has been authorized for rating on Form PD-82(a)

(e) **Application of Preference Rating.** The Supply House or any Sub-Supplier, in or-

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PUMPS
THE PUMP THAT IS SELF-ADJUSTING FOR WEAR
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BLACKMER PUMP COMPANY
18812 Century Avenue, S. W.
Grand Rapids, Michigan

der to apply the preference rating to deliveries to him must:

(1) sign the Acceptance at the end of a copy of this Order, detach it and file such signed Acceptance with the Director of Priorities: **Provided,** that after one such Acceptance of Preference Rating Order No. P-83 shall have been duly filed as herein provided, no additional Acceptance need be filed for subsequent applications of said Order, whether such subsequent applications shall be of an Order bearing the same or different Serial Number from the Order accepted; and

(2) furnish one copy of Preference Rating Order No. P-83, together with an unsigned form of acceptance thereof, to each of his Sub-Suppliers with whom he has placed a contract or purchase order for material to the delivery of which he elects to apply the preference rating hereby assigned. After one such copy of said Order, regardless of Serial Number, has been furnished to a particular Sub-Supplier, no additional copy of said Order need be furnished to that Sub-Supplier to cover any subsequent applications of the preference rating hereby assigned.

(3) The Supply House and each Sub-Supplier, in order to apply the preference rating hereby assigned to deliveries to him, must endorse the following statement on the original and on all copies of each Purchase Order or Contract for Material authorized for rating on Form PD-82(a), or to be physically or chemically incorporated into such material:

"Preference Rating A-8, Purchase Order for material pursuant to Preference Rating Order No. P-83, Serial No. ....., with which I am familiar."

The endorsement shall be manually signed by an authorized official of the Supply House or Sub-Supplier and the original, or a copy of the Purchase Order shall be delivered to the seller of such material. Such endorsement shall constitute a certification to the Office of Production Management that the Supply House or Sub-Supplier is entitled to apply the rating to such delivery pursuant to this Order. Such Purchase Order or Contract shall not include any material, the delivery of which is not rated pursuant to this Order.

(4) A Sub-Supplier who has been furnished with a copy of Preference Rating Order No. P-83, by two or more Supply Houses, or Sub-Suppliers, and who has received from such Supply House or Sub-Suppliers, endorsed Purchase Orders or Contracts for material rated pursuant to this Order, may include in a single Purchase Order or Contract, any part, or all, of the material which he requires to make his rated deliveries to such Supply Houses or Sub-Suppliers, but must specify in the endorsement on such single Purchase Order, all of the serial numbers contained in the Purchase Orders which have been so received by him and to fill which he is applying the preference rating.

(5) The Preference Rating hereby assigned may be applied only to written purchase orders or contracts.

(f) **Restrictions on Deliveries by Supply Houses.** No Supply House may make deliveries of material obtained by application of the preference rating hereby assigned except under Purchase Order or Contracts bearing a preference rating assigned by the Director of Priorities.

(g) **Records.** In addition to the records required to be kept under Priorities Regulation No. 1, the Supply House, and each Sub-Supplier placing or receiving any purchase order or contract rated hereunder, shall each retain, for a period of two years, for inspection by representatives of the Office of Production Management, endorsed copies of all such purchase orders or contracts, whether accepted or rejected, segregated from all other purchase orders or contracts or filed in such manner that they can be readily segregated for such inspection.

(h) **Communications to Office of Petroleum Co-ordinator.** Acceptances of this Order, all reports required to be filed hereunder, and all communications concerning this Order, shall, unless otherwise directed, be addressed to:

"Office of Petroleum Co-ordinator,
Washington, D. C. Ref. P-83"

(i) **Violations.** Any Person who wilfully violates any provision of this Order or who by any act or omission falsifies records to be kept or information to be furnished pursuant to this Order may be prohibited from receiving further deliveries of any Material subject to allocation, and such further action may be taken as is deemed appropriate, including a recommendation for prosecution under Section 35 (A) of the Criminal Code (18 U.S.C. 80).

(j) **Revocation or Amendment.** This Order may be revoked or amended at any time as to the Supply House or any Sub-Supplier. In the event of revocation, deliveries already rated pursuant to this Order shall be completed in accordance with said rating, unless the rating has been specifically revoked with respect thereto. No additional applications of the rating to other deliveries shall thereafter be made by the Supply House or Sub-Supplier affected by such revocation.

(k) **Applicability of Priorities Regulation No. 1.** This Order and all transactions affected thereby are subject to the provisions of Priorities Regulation No. 1, as amended from time to time, except to the extent that any provisions hereof may be inconsistent therewith, in which case the provisions of this Order shall govern.

(l) **Effective Date.** This Order shall take effect on the date specified in the heading hereof, and shall continue in effect until revoked.

(P. D. Reg. 1, Aug. 27, 1941, 6 F.R. 4489; O.P.M. Reg. 3 Amended, Sept. 2, 1941, 6 F. R. 4865; E. O. 8629, Jan. 7, 1941, 6 F. R. 191; E. O. 8875, Aug. 28, 1941, 6 F. R. 4483; sec. 2(a), Public No. 671, 76th Congress, Third Session, as amended by Public No. 89, 77th Congress, First Session; sec. 9, Public No. 783, 76th Congress, Third Session.)

Issued this 8th day of December, 1941.

ACCEPTANCE OF PREFERENCE RATING ORDER NO. P-83

To:
Name of Supply House .....
Address .....
Serial No. ..... Date .....

To be detached from the foregoing Order, signed by an authorized official of the Supply House or Sub-Supplier, and returned to the Office of Petroleum Co-ordinator, Washington, D. C., before the Supply House or Sub-Supplier applies the Preference rating assigned by the foregoing Order.

The Supply House or Sup-Supplier should execute only the Acceptance which he returned to the Office of Petroleum Co-ordinator. He should not execute the Acceptance attached to the copies of the Order which he furnishes to other persons when he first applies the preference rating.

(Before signing this Acceptance, read carefully Section (c), (d), (e) and (f) of the foregoing Order.)

The Supply House or Sub-Supplier named below hereby accepts Preference Rating Order No. P-83 and certifies to the Director of Priorities of the Office of Production Management that he is entitled to apply the preference rating assigned in said Order in accordance with its terms.

Dated this ..... day of ....., 194....

.....
Legal Name of Supply House or Sub-Supplier

By .....
Name and Title of Authorized Individual

(Section 35(a) of the Criminal Code, 18 U.S.C. 80, makes it a criminal offense to make a false statement of representation to any Department or Agency of the United States as to any matter within its jurisdiction.)

The Supply House may obtain additional copies of Preference Rating Order No. P-83 from the Office of Petroleum Co-ordinator, Washington, D. C. Sub-Suppliers may not obtain such copies from the Office of Petroleum Co-ordinator, but should procure them from the Supply House. This Order cannot be reproduced by either the Supply House or the Sub-Supplier.

Here's a profitable way to beat competition: Get the exclusive distribution rights in your territory for one or more of these top-notch brands: Beaver-Penn, Fort Pitt, Four-State and Penn Trump, all 100% Pure Pennsylvania, cold-proofed in 10-W and 20-W grades.

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FREEDOM *winter-grade* **MOTOR OILS**

Edgar Tells Cause, Effect Of Ethyl Fluid Allocation

(*Continued from Page* 18)

vailable. In addition, tetraethyl lead is a constituent of the fuel used by army tanks, armored cars, trucks, etcetera, for whose use gasoline of 80 octane number is specified. The quantity of tetraethyl lead used for the above purposes is increasing enormously, particularly since the military needs of the anti-Axis powers must be largely supplied from the United States.

IV. Tetraethyl Lead in the Petroleum Industry

Tetraethyl lead is an extremely important factor in the economic life of the petroleum industry. It appears to be economical to utilize some tetraethyl lead in the production of almost all gasoline of adequate (a term discussed further below) anti-knock value, and the small refiner particularly, is practically dependent upon tetraethyl lead as a means of producing marketable gasoline. It also permits flexibility of operation, in that a refiner by its use is enabled to operate to produce the maximum yield of gasoline, if desirable, or to adjust his volatility to meet seasonal requirements, or to change his supply of crude oil stocks, and at the same time give adequate anti-knock value to the finished gasoline by adjusting the quantity of tetraethyl lead. Any serious curtailment of tetraethyl lead would be extremely serious for the oil refiner. About 265 refiners, who between them produce over 90% of the country's gasoline, use tetraethyl lead in all or nearly all of their gasoline.

V. Methods of Increasing the Anti-Knock Value of Gasoline

The anti-knock value of gasoline is measured by the "octane number" scale. Today, aviation gasoline is largely of 91 or 100 octane number (the latter for all fighting planes); U. S. Army "all purpose" gasoline is 80 octane number, as is most "premium grade" motor gasoline; "regular grade" gasoline averages about 75 octane number; and "third grade" varies from perhaps 55 to 70 octane number. On the average the effect of tetraethyl lead on gasoline is about as follows: 1 c.c. of tetraethyl lead per gallon of gasoline increases the octane number by about 7; 2 c.c. per gallon by about 11, and 3 c.c. per gallon by about 14. Three c.c. per gallon is the maximum employed for automobile gasoline. The price of tetraethyl lead to the oil refiner is at present 0.20 cents per cubic centimeter.

Of the true anti-knock compounds, i.e., substances which in very minute amount have an appreciable effect on the anti-knock quality of gasoline, only tetraethyl lead has been found commercial; however, other methods exist for increasing the anti-knock quality of gasoline. In the first place, the gasoline obtained by simple distillation of crude oil, "straight-run" gasoline, has varying octane numbers depending upon the source and basic, character of the crude oil. Then, the "cracking" processes, which were primarily developed to increase the quantity of gasoline recoverable from crude oil, usually produce gasoline of higher anti-knock value than the "straight-run" gasoline. Furthermore, cracking processes have been developed designed specifically to increase the anti-knock value of gasoline, to a smaller or larger extent. Included in these are hydroforming, reforming, catalytic cracking, polymerization, etc. However, if these cracking processes are so operated as to produce the maximum increase in anti-knock value, they result in general in a decreased yield of gasoline, thus causing both an economic loss and a waste of natural resources. It is partially for these reasons and partially because of the tremendous investment

TABLE I. Production Level of Tetraethyl Lead

(*Pounds per Year*)

Raw Materials Consumed:	210,000,000 lbs. (Estimated Demand 1942)		185,000,000 lbs.		150,000,000 lbs. (Present Production rate)		100,000,000 lbs. (Proposed Curtailed rate)	
	per month	per year	per month	per year	per month	per year	per month	per year
Pig Lead (tons)	6,100	73,000	5,400	65,000	4,400	52,000	2,900	35,000
Chlorine (tons)								
a BEFORE SPRING 1942								
1 Chlorine produced	3,900	46,500	3,900	46,500	3,900	46,500	2,700	32,400
2 Chlorine consumed	7,600	91,200	6,500	78,000	4,700	56,900	3,800	45,600
3 Net consumed	3,000	36,000	2,600	22,800	800	10,300	1,100	13,200
4 Net consumed which could be used for any other purpose	2,100	25,000	900	5,800	—900	—10,800	—1,700	—20,400
b AFTER SPRING 1942								
1 Chlorine produced	4,400	53,000	3,900	46,500	3,100	37,500	2,100	25,000
2 Chlorine consumed	4,200	51,000	3,700	44,500	2,900	35,500	2,000	24,000
3 Net consumed	—200	—2,000	—200	—2,000	—200	—2,000	—100	—2,000
Alcohol Consumed (gallons)	1,400,000	16,900,000	1,040,000	12,500,000	840,000	10,100,000	290,000	3,440,000

TABLE II. Production Level of Tetraethyl Lead

(*Pounds per Year*)

Total	210,000,000	185,000,000	150,000,000	100,000,000
1942 Defense Requirements (Estimated)	50,000,000	50,000,000	50,000,000	50,000,000
Left For Civilian Use	160,000,000	135,000,000	100,000,000	50,000,000
Octane Number of Motor Gasoline				
Case 1				
Total volume 10% above 1941	Premium 80	Premium 80	Premium 80	Premium 80
Premium grade retained at 1941 volume	Regular 75	Regular 74	Regular 72.5	Regular 69.5
Base stock of present quality				
Case 2				
Total volume 10% above 1941				
Premium eliminated	Regular 75.5	Regular 74.5	Regular 73.2	Regular 70.5
Base stock of present quality				
Case 3				
Total volume 10% above 1941	Premium 80	Premium 80	Premium 80	Premium 80
Premium grade retained	Regular 74	Regular 73	Regular 71.5	Regular 68.5
Base stock degraded as expected	(or less)	(or less)	(or less)	(or less)
Case 4				
Total volume 10% above 1941				
Premium eliminated	74.5	73.5	72.2	69.5
Base stock degraded as expected	(or less)	(or less)	(or less)	(or less)

TABLE III. Effects of Octane Number Reduction

Tetraethyl Lead Production Levels

(*Pounds per Year*)

	210,000,000	185,000,000	150,000,000	100,000,000
Case 1 (as in Table II.)	Present quality retained—no effects	Few cars requiring adjustment. No serious effects	Substantial number of cars requiring adjustment. Substantial decrease in economy.	50% or more cars requiring adjustment. 1,300,000,000 gallons extra fuel used. $260,000,000 extra cost to motorist
Case 2 (as in Table II.)	10-15% of cars requiring adjustment; others not appreciably improved	10-15% of cars requiring adjustment; others not appreciably affected.	As above	As above (many cars practically inoperable)
Case 3 (as in Table II.)	Few cars requiring adjustment. No serious effects.	Increasing number of cars requiring adjustment; some increase in consumption.	Perhaps 40% more of cars requiring adjustments. About 1,000,000,000 gallons extra fuel consumed. Extra cost perhaps $200,000,000	Over 50% of cars requiring adjustment. Perhaps 1,500,000,000 gallons extra fuel consumed. $300,000,000 extra cost.
Case 4 (as in Table II.)	10-15% of cars requiring adjustment; others not appreciably affected.	Perhaps 25% of cars requiring adjustment. Appreciable increase in consumption.	As above	As above

required for new cracking plants that tetraethyl lead is so widely used today.

Other methods of securing anti-knock value consist in blending gasoline with such materials as benzol or other high anti-knock fuels. Both economy and limited supply make such processes impracticable on any but a very limited scale.

It is obvious, therefore, that a curtailment of tetraethyl lead means necessarily a loss in the anti-knock quality of gasoline. Even if investment costs did not make prohibitive the installation of sufficient modern cracking equipment to compensate for its loss, the staggering amount of steel required for such installation could not be spared from the defense effort.

VI. Results of Decreasing the Anti-Knock Value of Gasoline

It was stated as early as 1923 by Ricardo in England that the anti-knock quality of gasoline is so much more important than any other property that all the others become insignificant, as it is this property which determines the efficiency with which the heat of combustion of gasoline can be converted into power.

It is for this reason that as means of improving anti-knock value have become available and have been improved, such as cracking (in the broad sense) and tetraethyl lead, the anti-knock value of gasoline has improved steadily for many years and the automotive industry has, therefore, been able to design cars of increasing efficiency. Substantial increases in ton-miles per gallon have been achieved by this development. It is sometimes thought that the chief value of high anti-knock fuels for the automobile, in the high compression engine for which they were designed, is that of increased power and speed. The facts are that the high speed performance of an automotive engine is comparatively little affected by the anti-knock value of the gasoline, within reasonable limits. It is at low speed, during acceleration, and in hill climbing or pulling a heavy load, that anti-knock value is most important. It has been estimated by competent automotive engineers that a car requiring a 75 octane number gasoline to operate without knock could be made to operate on 70 octane gasoline by retarding the spark and that this would have relatively little effect upon high speed performance, but that for average driving, city and country, a 10% increase in fuel consumption would be inevitable. Thus, if all automobiles had a 75 octane number requirement, a drop in gasoline octane number from 75 to 70 would result in an increase in gasoline consumption for the United States of 2,500,000 gallons, and an increased crude oil consumption of 5,000,000,000 gallons. The motoring public would also have an increased fuel bill of $500,000,000!

Now all cars do not have octane number requirements of 75. As fuels have improved over a period of years, automobile compression ratios have steadily increased. Even for a given year, make and model considerable variation in anti-knock requirements is always found, because of manufacturing variations, tolerances of the spark distributor, accumulation of carbon, etcetera. To produce knock free operation in 100% of all existing cars would require an octane number of about 85. Various other lower percentages would be satisfied at lower octane levels. It is impossible to estimate with precision the exact figures on this point, but it cannot be far from the truth to say that an increase in gasoline consumption of one-half those given above would occur with a five octane number decrease for the gasoline of today. At least 50% of all cars on the road would have to be taken to service stations for adjustment, and for those cars now requiring around 80 octane number, a major rebuilding job would be necessary to make them operate on gasoline of 70 octane number.

It is clear that any serious decrease in the octane number of gasoline would result in a tremendous drain on the refining capacity of the petroleum industry, on our resources of crude oil, and on the motorists pocketbook.

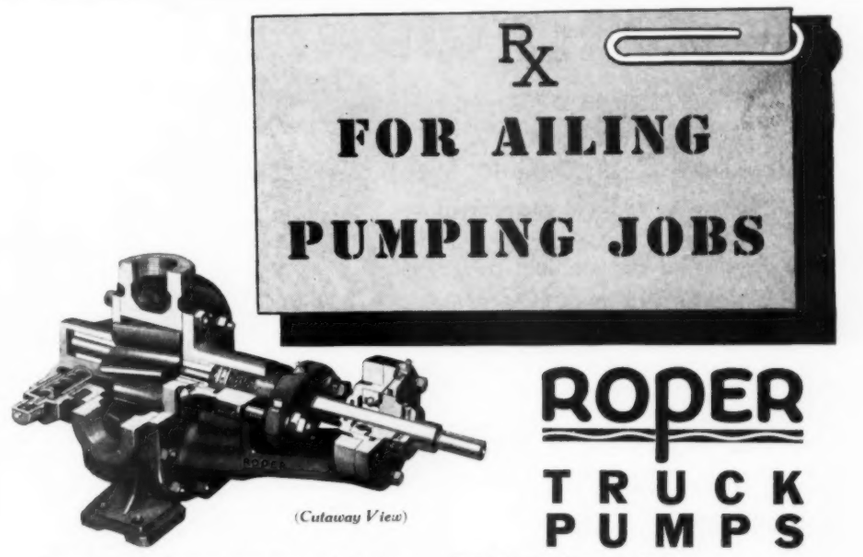
VII. Raw Materials Used in the Manufacture of Tetraethyl Lead

Of the raw materials used in the manufacture of tetraethyl lead, the only ones which may be said to have strategic importance are—(1) pig lead, (2) chlorine, and (3) alcohol. The quantities of these consumed at different production levels are given in Table I.

The industry has made every effort to conserve these materials. Pig lead cannot be conserved, but must be consumed in direct proportion to the production of tetraethyl lead. However, the price of pig lead is not of vital importance in the tetraethyl lead industry, and there seems no reason to believe that it cannot develop marginal lead sources for a part of its needs. Chlorine can be partially substituted by hydrochloric acid, and on the completion of a project now under construction the industry will be in the position of producing as a by-product of its own operations more chlorine than it consumes. It is only a small drain on the chlorine industry at present, and by the Spring of 1942, it will be no drain at all on this vital material. The industry cannot avoid a substantial use of alcohol, but it has just completed a plant which has reduced its alcohol requirements by 500,000 gallons per month, and some time in 1942, it expects to replace about 125,000 additional gallons per month by other raw material.

VIII. Demand for Tetraethyl Lead

During the last few years, there has been a steady increase in the demand for tetraethyl lead. In the first place, successive price reductions to the petroleum industry (the last in April, 1941) have made it more and more economical for the oil industry to rely on tetraethyl lead for a part of its anti-knock value, and to operate the refining processes less wastefully than would have been necessary to produce



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a comparable anti-knock quality in the base stock itself. Secondly, the increase in over-all gasoline gallonage, coupled with an increase in the percentage treated with tetraethyl lead, has caused an increase in demand. Third, the steady increase in anti-knock quality of gasoline has brought about increased lead use. Fourth, the increase in aviation and other defense uses has increased tremendously. The result has been that from a total consumption of 94,000,000 pounds in 1939, and 128,000,000 pounds in 1940, the 1941 consumption is estimated at 160,000,000 pounds. The 1942 demand has been estimated as about 210,000,000 pounds as compared with the industry's present manufacturing capacity of about 225,000,000 pounds. This would include 50,000,000 pounds for aviation and defense; an increase of about 10% to correspond to the predicted increase in gasoline gallonage, and an unpredictable increase to compensate for the strain imposed on the petroleum industry by the defense program. The tremendous program for 100 octane aviation gasoline will require stripping motor gasoline of some of its higher octane fractions, and also, because of the enormous volume of all gasoline required, it will be necessary for the refiner to produce a maximum yield of gasoline and this in turn will reduce the over-all anti-knock quality. In the normal course of events these decreases in the quality of gasoline would be corrected by the use of additional quantities of tetraethyl lead.

However, the Office of Production Management has already curtailed the production of tetraethyl lead, and the current production rate is already some 40% below the existing demand. Furthermore, there has been much discussion of still further curtailment, and no encouragement whatever for further increase in production level.

IX. Allocation of Raw Materials to the Tetraethyl Lead Industry

Since curtailment of raw materials to any industry brings about, of necessity, some dislocations of related industries as well, it seems well to survey the problem of the tetraethyl lead industry, and attempt to evaluate the disadvantages of its raw material consumption against the advantages to the nation's war time economy of allocating adequate raw materials to it, and the disadvantages of curtailing it.

(1) The tetraethyl lead industry itself does not require a large amount of labor, and, therefore, the only serious direct effect of curtailing it is on its own earnings, which are not relevant to this discussion.

(2) The effect on the petroleum industry is very serious. If we assume that the figures given above for 2,500,000,000 additional gallons of crude oil necessarily processed for a 5 octane number reduction in gasoline quality, then the already overburdened petroleum industry will be still harder pressed to meet the demand for gasoline, and the aviation gasoline program may even be somewhat imperiled. Furthermore, the competitive marketing of petroleum products will be considerably handicapped, particularly for the small refiner, who has no possible way of compensating for the loss in tetraethyl lead. For curtailment of tetraethyl lead to an extent greater or less than that required to produce a 5 octane number decrease in quality, these factors will be increased or decreased approximately proportionally.

(3) Waste of natural resources, through increased gasoline consumption for the same number of car-miles, to whatever extent it occurs, must be balanced against the saving of raw materials going into the tetraethyl lead which could have prevented such waste.

(4) The effect of curtailment of tetraethyl lead on automotive transportation of all kinds will be serious. In addition to the increase in fuel consumption, it is certain that the commercial transportation will be seriously affected. Trucks will be able to carry less load (an important item during this emergency); buses will be less able to meet their schedules and carry their already increased loads; the farm tractor will be able to plough less acreage per day. These effects are hardly capable of exact quantitative expression, but they are inescapable, and they will become greater as the tetraethyl lead available decreases.

(5) The effect on the public will be partially psychological and partly practical. It will not be helpful to the country's morale to find a formerly satisfactory automobile becoming unsatisfactory in operation, having to be taken to the service station for spark adjustment (for a price), and after adjustment giving decreased gasoline mileage. Furthermore, an increase in the motorists' gasoline bill of $250,000,000 in order to save perhaps $10,000,000 worth of raw materials may not seem wise economy, even in war time, unless vital defense needs simply cannot be met without it.

In Tables (I), (II) and (III) under various production levels, in addition to the raw materials consumed, there are given data as to the effect on average octane number levels of gasoline corresponding, as nearly as these may be estimated, and the briefest possible indication of some of the above factors corresponding. It would be the writer's conclusion, as a result of this analysis, that the present restricted operating level is definitely too low, and that raw material supplies to the industry should be increased at once to permit a manufacture of at least 185,000,000 pounds per year, in the general interest of the nation's economy. It is obvious that in this, as in any manufacturing industry, it is necessary that all of the essential raw materials be allocated in the proportions required in the process to produce the quantity decided upon.

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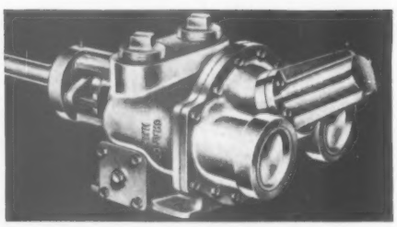

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MARKETS

Mid-Continent

TULSA, Dec. 6—Most refined products continued in good demand in the Mid-Continent the past week. Burning oil shipments against contracts were "fair to good." Confusion over wax ceiling and allocation of tetraethyl lead supplies unsettled market. Quotations for most part were unchanged in all districts.

Wax demand was good. Refiners were "wondering what to do" about prices, pointing out that OPA excluded Tulsa as a basing point in its ceiling "order". One refiner wired OPA protesting this omission. Refiner who had been quoting 5.75c for 124-126 A.m.p. white crude scale withdrew his quotation and offered "white semi-refined 128 A.m.p. minimum" at 5.65c in bags, FOB Tulsa. No other refiners offered 124-126 A.m.p. open spot; one refiner continued to quote 6c for 131-33 A.m.p.

"Tetraethyl lead situation" had most refiners in "discussion" stage at week's end. A Texas refiner reduced octane rating for "regular" grade to 73 oct. and an Oklahoma refiner discontinued manufacture of "leaded third grade" but continued to supply Ethyl and 72-74 oct. to regular customers. Two refiners were said to have reduced "house brand" octane ratings, but this could not be confirmed. Some refiners said they had sufficient lead on hand for December; others were awaiting recommendations of OPC's district committees before taking action.

Two inter-refinery gasoline inquiries for shipment over 1942 were reported in the market. One called for 3 to 400,000 gals. per month; the other, for 45 cars 60 oct. & below per month.

Pennsylvania

NEW YORK, Dec. 6—Western Pennsylvania refiners reported no quotations for scale wax throughout the past week and said they were "holding off" wax offerings pending clarification of wax price "ceiling" announced by OPA Nov. 21, effective Dec. 1.

"We're not offering or committing ourselves until we see what we can do," refiners said. Chief problem seemed to be that of freight equalization, with need for Penna. oil field basing point voiced by many refiners. Packaging differentials also caused some confusion.

Fuel oils were "soft" in the lower field resulting from Illinois and Michigan competition, with low quotations down 0.25c on all grades. Reductions of 0.125 to 0.875c in quotations were reported by refiners. Nos. 1 and 2 fuels ranged from 5.375 to 6c. No. 3 fuel from 5.125 to 5.875c, and 36-40 gravity from 5 to 5.75c. Upper field fuels were "weak," but one refiner said he was having no trouble getting 6.25c for 36-40 fuel. One other upper refiner offering this grade quoted 6c.

Kerosine was firm in both fields, but there was "not much movement."

Bright stock was "very firm," with "definite activity" reported. Buyer seeking option on 20,000 bbls. was said to have been unable to find anybody offering. Refiners quoted 25 p. t. to their regular customers at 25 to 26c.

Atlantic Coast

NEW YORK, Dec. 6—Heating oils continue to run "far below normal" at Atlantic Coast points the week ended Dec. 6, with demand fluctuating with the weather. Some suppliers said they still saw the possibility of making up lost October and November gallonage if the remaining winter months were very cold. Despite present slow movement, prices generally held at posted levels.

Kerosine was "firm," with demand and shipments at normal rate. At Norfolk, kerosine was priced 0.1c higher at 5.4 to 5.5c.

Gasoline continued in heavy demand, with mild weather seen as the important factor here also. Sales generally were limited to regular customers; shipments "like mid-summer."

Gulf

NEW YORK, Dec. 6—Activity at the Gulf the past week centered on No. 2 fuel and kerosine, with sales and a number of inquiries for both products reported.

Cargo of 100,000 bbls. of No. 2 fuel sold at 4c for January lifting, coastwise. Three inquiries for December cargoes of No. 2 were reported, with refiners quoting 4 to 4.25c.

Sale of a 21,000-bbl. barge-lot of kerosine was reported at 4.125c, for lifting, coastwise, Dec. 6 to 10. Refiner who made the sale said he was still quoting kerosine at 4.25c, having "just bent a little on this sale." Kerosine inquiries reported were for two 70,000-bbl. cargoes, January lifting, coastwise; 60,000 bbls. for January-February lifting, coastwise; four cargoes for lifting December through February, coastwise; a cargo and a 20,000-bbl. part cargo, lifting dates and destinations undisclosed. Quotations for kerosine ranged from 4 to 4.5c.

Inquiries for two 80,000-bbl. cargoes of "gas oil for cracking," December and January lifting, coastwise, respectively, and a "cargo" of min. 80 oct. (research) gasoline for January lifting also were reported. Gasoline quotations were unchanged.

Mid-Western

CHICAGO, Dec. 6—Shipments of most products against contracts were reported "fair to good" by refiners and tank car marketers in Chicago the past week. "November was the best month we've had in the past 5 years," one refiner commented. Quotations for all products were generally unchanged.

Open spot sales reported by 4 marketers during the week were: 10 cars 80-82 oct. Ethyl at 6.5c; 13 cars 72-74 oct. at 5.875c; 3 cars 60 oct. & below at 5.25c; 5 cars 41-43 kerosine at 3.875c; 1 car range oil at 3.875c; and 2 cars No. 2 straw fuel, at 3.375c, FOB Group 3.

Refiners Group 3 quotations ranged 7.1 to 7.4c for 80-82 oct., 6 to 6.375c for 72-74 oct., 5.25 to 5.625c for 60 oct. & below, 4.375 to 4.75c for 41-43 kerosine, 4 to 4.2 for range oil, and 3.6 to 3.8c for No. 2 straw.

Marketers Group 3 quotations ranged 6.125 to 6.5c, 5.625 to 5.875c, 5.125 to 5.25c, 3.75 to 4.125c, 3.75 to 4c, and 3.375 to 3.625c, for the 6 products, respectively.

California

LOS ANGELES, Dec. 6—Pacific Coast export markets were quiet the past week, with few inquiries from foreign interests and no changes reported in quotations for cargoes of gasoline.

Wide range of quotations for all grades of gasoline was reported by independent refiners in the Los Angeles Basin. Small quantities of third grade gasoline were reported offered at 4.25c at the rack, in combination with leaded at 5.5c and Ethyl at 6.5c, but at most independent plants the range for third grade was said to be from 4.5 to 5c.

Gas and diesel oils ranged from $1.15 to $1.26 per bbl., and kerosine distillate from $1.20 to $1.26 per bbl. at independent plants in the Basin and San Joaquin Valley areas.

No change was reported in natural gasoline quotations. Demand was said to be in excess of supply, with prices firm at 4.75c to 5.25c, delivered at the absorption plant.

REFINERY and SEABOARD PRICES

In bulk lots by Motor Transport, Tank Car, Barge or Tanker as shown

(NOTE—Parenthetical figures after prices indicate number of companies quoting when less than three companies are quoting.)

HOW PRICES ARE REPORTED—

Refinery and Seaboard prices in National Petroleum News are gathered by PLATT'S OILGRAM and are as published in the Monday issue of the OILGRAM.

PLATT'S OILGRAM is a reporting service issued in three identical editions daily from News Bureaus at New York, Cleveland, and Tulsa, Okla. PLATT'S OILGRAM gathers and publishes what its publisher and representatives believe to be accurate news of sales, prices and current happenings affecting the oil industry and that will be of interest to its subscribers. As this information is usually private, OILGRAM reports it according to what it is able to obtain from sources deemed reliable.

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Prices shown in the tables are quotations (meaning sellers' general offers or posted prices), or actual sales prices, reported to OILGRAM by refiners for "open spot" transactions, except as otherwise specified.

Prices arrived at by discounts off a specified price or "market date of shipment," prices named in contracts or prices arrived at in accordance with any arrangement made prior to date of sale, are not for "open spot" transactions and therefore are not considered in making the price tables. Prices made to brokers and prices in "Inter-refinery" transactions are also not considered except as may be noted.

All prices are for "immediate" shipment except in Gulf Coast bulk transactions where shipment is generally to be made in ninety days. Prices are FOB refineries, pipelines, or tanker terminals in districts designated.

Prices shown are for quantities in bulk such as tank car lots, motor transport lots or barge lots; and in cents per gallon; heavy fuel oils are in dollars per barrel of 42 U.S. gallons; wax and petrolatums are in cents per pound. Prices applying to barges or cargoes only are so designated.

Prices do not include taxes or inspection fees. Prices are published at the close of the business day.

Mid-Western prices in the tables were gathered from refiners with offices located in Chicago and the surrounding territory. While the prices are quoted on a Group 3 (Oklahoma) freight basis, this is in accordance with the custom of the oil industry which uses Group 3 as a price basis for the ease of comparing prices even when the material originates in another refining district. Other refinery prices are given by and for the particular refining district where the material is made and from which it is shipped.

When prices obtained by OILGRAM do not conform to these conditions the exception and the new conditions are noted in the news lead or in conjunction with the price table by footnote or otherwise, for the particular refinery or sales district involved.

Crude oil and products covered by OILGRAM'S news and price service, except where noted, have been represented to the publisher as fully up to the customary trade specifications indicated and according to the generally accepted methods of test; and all crude oil and all products thereof as having been lawfully produced and transported.

Any apparent error should be reported to the nearest OILGRAM or National Petroleum News office at once as no correction will be made after the second issue of the OILGRAM or National Petroleum News following its publication.

NOTICE—Owing to great demand, refiners generally limit quotations to regular customers and refuse bids, though higher, from others. Refiners' prices and sales shown; bids reported in market leads.

Summary of Daily Gasoline Prices (Dec. 2 to Dec. 8)

U. S. Motor, (ASTM octane)	Monday Dec. 8	Friday Dec. 5	Thursday Dec. 4	Wednesday Dec. 3	Tuesday Dec. 2
80-82 octane Ethyl:					
Oklahoma	6.75 – 7.55	6.75 – 7.55	6.75 – 7.55	6.75 – 7.55	6.75 – 7.55
Mid-Western (Group 3 basis)	7.1 – 7.4	7.1 – 7.4	7.1 – 7.4	7.1 – 7.4	7.1 – 7.4
N. Tex. (For shpt. to Tex. & N. M. dest'ns.)	7 – 7.625	7 – 7.625	7 – 7.625	7 – 7.625	7 – 7.625
W. Tex. (For shpt. to Tex. & N. M. dest'ns.)	7.2–7.25 (2)	7.2–7.25 (2)	7.2–7.25 (2)	7.2–7.25 (2)	7.2–7.25 (2)
72-74 octane:					
Oklahoma	6 – 6.375	6 – 6.375	6 – 6.375	6 – 6.375	6 – 6.375
Mid-Western (Group 3 basis)	6 – 6.375	6 – 6.375	6 – 6.375	6 – 6.375	6 – 6.375
N. Tex. (For shpt. to Tex. & N. M. dest'ns.)	6 – 6.625	6 – 6.625	6 – 6.625	6 – 6.625	6 – 6.625
W. Tex. (For shpt. to Tex. & N. M. dest'ns.)	6.125–6.25	6.125–6.25	6.125–6.25	6.125–6.25	6.125–6.25
63-66 octane:					
Oklahoma	5.625–6	5.625–6	5.625–6	5.625–6	5.625–6
Mid-Western (Group 3 basis)	5.625–6	5.625–6	5.625–6	5.625–6	5.625–6
N. Tex. (For shpt. to Tex. & N. M. dest'ns.)	5.625–6.25	5.625–6.25	5.625–6.25	5.625–6.25	5.625–6.25
W. Tex. (For shpt. to Tex. & N. M. dest'ns.)	5.75 – 5.875	5.75 – 5.875	5.75 – 5.875	5.75 – 5.875	5.75 – 5.875
60 octane & below:					
Oklahoma	5.25 – 5.625	5.25 – 5.625	5.25 – 5.625	5.25 – 5.625	5.25 – 5.625
Mid-Western (Group 3 basis)	5.25 – 5.625	5.25 – 5.625	5.25 – 5.625	5.25 – 5.625	5.25 – 5.625
N. Tex. (For shpt. to Tex. & N. M. dest'ns.)	5.25 – 5.875	5.25 – 5.875	5.25 – 5.875	5.25 – 5.875	5.25 – 5.875
W. Tex. (For shpt. to Tex. & N. M. dest'ns.)	5.375–5.5	5.375–5.5	5.375–5.5	5.375–5.5	5.375–5.5
Motor Gasoline, 72-74 octane (ASTM)					
New York harbor	8 – 8.5	8 – 8.5	8 – 8.5	8 – 8.5	8 – 8.5
New York harbor, barges	7.9 – 8.5	7.9 – 8.5	7.9 – 8.5	7.9 – 8.5	7.9 – 8.5
Philadelphia district	8 – 8.25	8 – 8.25	8 – 8.25	8 – 8.25	8 – 8.25
Baltimore district	7.75 – 8.25	7.75 – 8.25	7.75 – 8.25	7.75 – 8.25	7.75 – 8.25
Motor Gasoline:					
Western Penna. Bradford-Warren:					
Min. 80 Oct. ('39 Research)	8 (2)	8 (2)	8 (2)	8 (2)	8 (2)
74-76 Oct. (ASTM)	7.5 (1)	7.5 (1)	7.5 (1)	7.5 (1)	7.5 (1)
74-76 Oct. (L-3)	7.5–7.75 (2)	7.5–7.75 (2)	7.5–7.75 (2)	7.5–7.75 (2)	7.5–7.75 (2)
Western Penna. Other Districts:					
Min. 80 Oct. ('39 Research)	7.75–8 (2)	7.75–8 (2)	7.75–8 (2)	7.75–8 (2)	7.75–8 (2)
74-76 Oct. (ASTM)	6.75 – 7.25	6.75 – 7.25	6.75 – 7.25	6.75 – 7.25	6.75 – 7.25
74-76 Oct. (L-3)	6.75 – 7	6.75 – 7	6.75 – 7	6.75 – 7	6.75 – 7

REFINERY PRICES

Gasoline—U. S. Motor (ASTM) except where otherwise specified

Prices Effective	Dec. 8	Dec. 1
OKLAHOMA		
80-82 oct. Ethyl	6.75 – 7.55	6.75 – 7.55
72-74 oct.	6 – 6.375	6 – 6.375
63-66 oct.	5.625–6	5.625–6
60 oct. & below	5.25 – 5.625	5.25 – 5.625
60-62 400 e.p.	5.375 (1)	5.375 (1)
MID-WESTERN (Group 3 basis)		
80-82 oct. Ethyl	7.1 – 7.4	7.1 – 7.4
72-74 oct.	6 – 6.375	6 – 6.375
63-66 oct.	5.625–6	5.625–6
60 oct. & below	5.25 – 5.625	5.25 – 5.625
N. TEX. (For shpt. to Tex. & N. M. dest'ns.)		
80-82 oct. Ethyl	7 – 7.625	7 – 7.625
72-74 oct.	6 – 6.625	6 – 6.625
63-66 oct.	5.625–6.25	5.625–6.25
60 oct. & below	5.25 – 5.875	5.25 – 5.875
60-62, 400 e.p.	5.5 – 6 (1)	5.5 – 6 (1)
W. TEX. (For shpt. to Tex. & N. M. dest'ns.)		
80-82 oct. Ethyl	7.2–7.25 (2)	7.2–7.25 (2)
72-74 oct.	6.125–6.25	6.125–6.25
63-66 oct.	5.75 – 5.875	5.75 – 5.875
60 oct. & below	5.375–5.5	5.375–5.5
CENT. W. TEX. (Prices to truck transports)		
80 oct. & above	7.125 (2)	7.125 (2)
72-74 oct.	6.125 (2)	6.125 (2)
67-69 oct.	5.625–5.875 (2)	5.625–5.875 (2)
62 oct. & below	5.375 (2)	5.375 (2)
AMARILLO, TEX. (For shpt. to W. Okla. & Tex. differential territory.)		
60 oct. & below	5.375–5.875 (2)	5.375–5.875 (2)
60-62, 400 e.p.	5.5 – 6 (1)	5.5 – 6 (1)

Prices Effective	Dec. 8	Dec. 1
KANSAS (For Kansas destinations only)		
80-82 oct. Ethyl	7.375–7.5 (2)	7.375–7.5 (2)
72-74 oct.	6.3 – 6.375	6.3 – 6.375
63-66 oct.	5.9 – 6	5.9 – 6
60 oct. & below	5.5 – 5.625	5.5 – 5.625
ARK. (For shipment to Ark. & La.)		
72-74 oct.	6 (1)	6 (1)
70-72 oct.	5.875 (1)	5.875 (1)
60 oct. & below	5.5 (1)	5.5 (1)
WESTERN PENNA. (Motor gasoline.)		
Bradford-Warren:		
Min. 80 oct. ('39 research)	8 (2)	8 (2)
74-76 oct. (ASTM)	7.5 (1)	7.5 (1)
74-76 oct. (L-3)	7.5–7.75 (2)	7.5–7.75 (2)
Other districts:		
Min. 80 oct. ('39 research)	7.75–8 (2)	7.75–8 (2)
74-76 oct. (ASTM)	6.75 – 7.25	6.75 – 7.25
74-76 oct. (L-3)	6.75 – 7	6.75 – 7
CENTRAL MICHIGAN (FOB Central Mich. refinery group basis for shpt. within Mich.; shpts. may originate at plants outside Central group).		
U.S. Motor: (Oct. L-3):		
72-74 oct.	8.5	8.5
67-69 oct.	7.7 – 7.75	7.7 – 7.75
Str. run gasoline, excluding Detroit shpt.	6 – 6.25	6 –6.25
OHIO (S. O. Ohio quotations for statewide delivery and subject to exceptions for local price disturbances)		
72-74 oct.	8.375	8.375
CALIFORNIA U.S. Motor:		
58-61 grav., 375-400 e.p., 65 oct. & above	6.5 – 8	6.5 – 8
54-58 grav., for outside state shipment	5 – 7	5 – 7
54-58 grav., for instate shipment	5 – 6.75	5 – 6.75

Kerosine, Gas & Fuel Oils

Prices Effective	Dec. 8	Dec. 1
OKLAHOMA		
41-43 grav. w.w.	4.375 – 4.75	4.375 – 4.75
42-44 grav., w.w.	4.5 – 4.875	4.5 – 4.875
Range Oil	4 – 4.375	4 – 4.375
No. 1 P.W.	3.875 – 4.25	3.875 – 4.25
No. 1 straw	3.5 –4.25 (2)	3.5 –4.25 (2)
No. 2 straw	3.625 – 4.125	3.625 – 4.125
No. 3 fuel	3.5 – 3.625	3.5 – 3.625
U.G.I. Gas Oil	3.625 (1)	3.625 (1)
No. 6 fuel	$0.90 (1)	$0.90 (1)
14-16 fuel	$0.95 (2)	$0.95 (2)
MID-WESTERN (Group 3 basis)		
41-43 grav. w.w.	4.375 – 4.75	4.375 – 4.75
42-44 grav. w.w.	4.5 – 4.875	4.5 – 4.875
Range Oil	4 – 4.2 (2)	4 – 4.2 (2)
No. 1 p.w.	3.875 – 4.125	3.875 – 4.125
No. 2 straw	3.6 – 3.8	3.6 – 3.8
No. 3	3.5 – 3.7	3.5 – 3.7
No. 5	$0.85 (1)	$0.85 (1)
No. 6	$0.85-$0.875 (2)	$0.85-$0.875 (2)
N. TEX (For shpt. to Tex. & N. M. dest'ns.)		
41-43 grav. w.w.	4.125 – 4.875	4.125 – 4.875
No. 1 P.W.	4.2 – 4.5 (2)	4.2 – 4.5 (2)
AMARILLO, TEX. (For shpt. to W. Okla. & Tex. differential territory.)		
41-43 grav. w.w.	4.75 (2)	4.75 (2)
No. 1 straw	4.3 (1)	4.3 (1)
KANSAS (For Kansas destinations only)		
41-43 grav. w.w.	4.7 (1)	4.7 (1)
42-44 gravity w.w.	4.8 – 4.875	4.8 – 4.875
No. 1 p.w.	4.2 – 4.3	4.2 – 4.3
No. 6 fuel	$0.90-$0.925 (2)	$0.90-$0.925 (2)

REFINERY PRICES (Continued)

(NOTE—Parenthetical figures after prices indicate number of companies quoting when less than three companies are quoting.)

NOTICE—Owing to great demand, refiners generally limit quotations to regular customers and refuse bids, though higher, from others. Refiners' prices and sales shown; bids reported in market leads.

Kerosine, Gas & Fuel Oil

(Continued)

Prices Effective	Dec. 8	Dec. 1
ARK. (For shipment to Ark. and La.)		
41-43 grav. w.w.	4.625 (1)	4.625 (1)
No. 1	4 (1)	4 (1)
No. 2	3.5 (1)	3.5 (1)
No. 3 fuel	3.5 (1)	3.5 (1)
Tractor fuel, for shpt. to Ark. points only.	5.125 (1)	5.125 (1)
WESTERN PENNA.		
Bradford-Warren:		
45 grav. w.w.	6.25	6.25
46 grav. w.w.	6.375 (1)	6.375 (1)
No. 1 fuel	6.125–6.25	6.125–6.25
No. 2 "	6 –6.25	6 –6.25
No. 3 "	6 –6.25 (2)	6 –6.25 (2)
36-40 gravity	6 –6.25 (2)	6 –6.25 (2)
Other districts:		
45 grav. w.w.	6.25 – 6.375	6.25 – 6.375
46 grav. w.w.	6.25 – 6.5	6.25 – 6.5
47 grav. w.w.	6.375–6.625	6.375–6.625
No. 1 fuel	5.375–6	5.625–6
No. 2 "	5.375–6	5.625–6
No. 3 "	5.125–5.875	5.375–6
36-40 grav., Pittsburgh dist. prices excluded	5 – 5.75	5.25 – 5.875
CENTRAL MICHIGAN (FOB Central Mich. refinery group basis for shpt. within Mich.; shpts. may originate at plants outside Central group.)		
47-49 gravity w.w.	5.8 – 6	5.8 – 6
P.W. Distillate	5.5 – 6	5.5 – 6
No. 3 gas oil, Straw.	5 – 5.8	5 – 5.8
U.G.I. gas oil	4.5–4.875 (2)	4.5–4.875 (2)
Fuel Oils (Vis. at 100).		
300-500 Vis.	4 –4.25 (2)	4 –4.25 (2)
100-300 Vis.	4.5 (1)	4.5 (1)
OHIO (S. O. Ohio quotations for statewide delivery)		
Kerosine	7	7
CALIFORNIA		
40-43 grav. w.w.	4.5 – 6	4.5 – 6
San Joaquin Valley:		
Heavy fuel	$0.80	$0.80
Light fuel	$0.85	$0.85
Diesel fuel	2.75 – 4	2.75 – 4
Stove dist.	2.75 – 4	2.75 – 4
Los Angeles:		
Heavy fuel	$0.75 –$0.80	$0.75 –$0.80
Light fuel	$0.80 –$0.85	$0.80 –$0.85
Diesel fuel	2.75 – 4	2.75 – 4
Stove dist.	2.75 – 4	2.75 – 4
San Francisco:		
Heavy fuel	$0.85	$0.85
Light fuel	$0.95	$0.90
Diesel fuel	4.5	4.5
Stove dist.	5.5	5.5

Note: All above heavy fuels meet Pacific specification 400; light fuel, spec. 300; Diesel fuels, spec. 200; and stove distillate, spec. 100.

Lubricating Oils

WESTERN PENNA.

Prices are for sales made, or offers reliably reported, to jobbers & compounders only.

Viscous Neutrals—No. 3 col. Vis. at 70° F

200 Vis. (180 at 100°) 420-425 fl.		
0 p.t.	40.5 (1)	40.5 (1)
10 p.t.	39.5 (1)	39.5 (1)
15 p.t.	38.5 (1)	38.5 (1)
25 p.t.	33	33
150 Vis. (143 at 100) 400-405 fl.		
0 p.t.	38.5 (1)	38.5 (1)
10 p.t.	37.5 (1)	37.5 (1)
15 p.t.	36.5 (1)	36.5 (1)
25 p.t.	31	31
Cylinder Stocks		
Brt. stk., 145-155 vis. at 210°, 540-550 fl., No. 8 col.		
10 p.t.	30.5 (1)	30.5 (1)
15 p.t.	29.5 (1)	29.5 (1)
25 p.t.	25–26	25–26
600 S.R. filterable	15–16	15–16
650 S.R.	15.5–16.5	15.5–16.5
600 fl.	16–17	16–17
630 fl.	17–17.5	17–17.5

MID-CONTINENT (F. o. b. Tulsa)

Neutral Oils (Vis. at 100° F. 0 to 10 P.P.)

Pale Oils:

Vis. Color		
60- 85—No. 2	8 – 8.5	8 – 8.5
86-110—No. 2	8.5 – 8.75	8.5 – 8.75
150—No. 3	14.5	14.5
180—No. 3	15	15
200—No. 3	15–15.5	15–15.5
250—No. 3	16.5	16.5
280—No. 3	17–17.5	17–17.5
300—No. 3	18–18.5	18–18.5

Lubricating Oils (Cont'd)

Prices Effective	Dec. 8	Dec. 1
Red Oils:		
180—No. 5	15 (1)	15 (1)
200—No. 5	15–15.5 (2)	15–15.5 (2)
280—No. 5	17.5 (1)	17.5 (1)
300—No. 5	17.5–18.5	17.5–18.5

Note: Viscous Neutrals, 15-25 p.p. generally are quoted 0.5c under 0-10 p.p. oils. Non-viscous oils, 15-25 p.p., generally are quoted 0.25c under 0-10 p.p. oils.

Bright Stock—Vis. at 210°		
200 Vis. D	27 (1)	27 (1)
150-160 Vis. D:		
0 to 10 p.p.	23–23.5	23–23.5
10 to 25 p.p.	22.5–23	22.5–23
25 to 40 p.p.	23 (1)	23 (1)
150-160 Vis. E	22–22.5	22–22.5
120 Vis. D:		
0 to 10 p.p.	22–22.5	22–22.5
600 S.R. Dark Green	9–9.5 (2)	9–9.5 (2)
600 S.R. Olive Green	10–11	10–11
631 S.R.	18.5 (1)	18.5 (1)
Black Oil	4–5.5 (2)	4–5.5 (2)

SOUTH TEXAS Neutral Oils

Vis. Color		
Pale Oils: (*Vis. at 100° F.*)		
100 No. 1½-2½	6.5	6.5
200 No. 2-3	8.75	8.75
300 No. 2-3	9.25	9.25
500 No. 2½-3½	10	10
750 No. 3-4	10.25	10.25
1200 No. 3-4	10.375	10.375
2000 No. 4	10.5	10.5
Red Oils:		
100 No. 5-6	6.5 (2)	6.5 (2)
200 No. 5-6	8.75	8.75
300 No. 5-6	9.25	9.25
500 No. 5-6	10	10
750 No. 5-6	10.25	10.25
1200 No. 5-6	10.375	10.375
2000 No. 5-6	10.5–11.5	10.5–11.5

CHICAGO (From Mid-Continent p.l. crude.)

Neutral oils (Vis. at 100° F. 0 to 10 p.p.)

Pale Oils

Vis. Color		
60-85—No. 2	9.5 (1)	9.5 (1)
86-110—No. 2	10 (1)	10 (1)
150—No. 3	15.5 (1)	15.5 (1)
180—No. 3	16 (1)	16 (1)
200—No. 3	16 (1)	16 (1)
250—No. 3	17 (1)	17 (1)
Red Oils:		
180—No. 5	16 (1)	16 (1)
200—No. 5	16 (1)	16 (1)
250—No. 5	17 (1)	17 (1)
280—No. 5	18 (1)	18 (1)
300—No. 5	18.5 (1)	18.5 (1)

Note: Viscous oils, 15 to 30 p.p. are quoted 0.5c lower; 60-85 and 86-110 No. 2 non-viscous oils, 15c to 30 p.p., 0.25c lower.

Unfiltered Steam Refined: (Viscosity at 210°)		
140	11.5 (1)	11.5 (1)
160	12.5 (1)	12.5 (1)
200	13.5 (1)	13.5 (1)
Bright stocks, 160 vis. at 210 No. 8 color:		
0 to 10 p.p.	24 (1)	24 (1)
15 to 25 p.p.	23.5 (1)	23.5 (1)
30 to 40 p.p.	21.5 (1)	21.5 (1)
E filtered Cyl. Stock	15.5 (1)	15.5 (1)

Note: To obtain prices delivered in Chicago, add 0.25c per gal.

Natural Gasoline

(Group 3 & Breckenridge prices are to blenders on freight basis shown below. Shipments may originate in any Mid-Continent manufacturing district.)

FOB GROUP 3

Grade 26-70	5.125 (Sales)	5.125 (Sales)

FOB BRECKENRIDGE

Grade 26-70	4.75 (Qtns.)	4.75 (Qtns)

CALIFORNIA (FOB plants in Los Angeles basin)

75-85, 350-375 e.p. for blending	4.75 – 5.25	4.75 – 5.25

Naphtha and Solvent

Prices Effective	Dec. 8	Dec. 1
(FOB Group 3)		
Stoddard solvent	6.625	6.625
Cleaners' naphtha	7.125	7.125
V. M. & P. naphtha	7.125	7.125
Mineral spirits	6.125	6.125
Rubber solvent	7.125	7.125
Lacquer diluent	7.375–8.125	7.375–8.125
Benzol Diluent	7.875–8.625	7.875–8.625
WESTERN PENNA.		
Untreated naphtha	7 –7.25 (2)	7 –7.25 (2)
Stoddard solvent	7.25 – 7.5	7.25 – 7.5
OHIO (S. O. Ohio quotations for statewide delivery):		
V.M.&P. naphtha, D.C. naphtha, Varnolene & Sohio solvent	10	10
Rubber solvent	9	9

Wax

White Crude Scale:

WESTERN PENNA. (Bbls. C.L., N. Y.)		
122-124 A.m.p.	No Price	No Price
124-126 A.m.p.	No Price	No Price
OKLAHOMA (Bbls. or burlap bags, C.L.)		
124-6 AMP	No Price	5.75 (1)
131-3 AMP	6 (1)	6 (1)
128 AMP (Min.), white semi-refined, bags	5.65 (1)	....
CHICAGO (FOB Chicago district refinery of one refiner, in bags or slabs loose, carloads. Melting points are EMP (ASTM) methods: add 3° F. to convert into AMP.)		
Fully refined:		
122-124 (bags only)	5.9	5.9
125-127	5.9	5.9
127-129	6.15	6.15
130-132	6.85	6.85
132-134	7.1	7.1
135-137	7.85	7.85

Petrolatums

WESTERN PENNA. (Bbls., carloads; tank cars, 0.5c per lb. less.)		
Snow White	6.125–7.25	6.125–7.25
Lily White	5.375–6.125	5.375–6.125
Cream White	4.375–5.375	4.375–5.375
Light Amber	3.375–3.875	3.375–3.875
Amber	3.125–3.625	3.125–3.625
Red	3 – 3.5	3 – 3.5

Group 3 Freight Rates

To Division Headquarters Points of Standard Oil Co. of Indiana

	Gasoline Kerosine Cents per Cwt.	Cents per gal. 6.6 lbs.	Distillate-Gas Oil-Fuel Oil Cents per Cwt.	Cents per gal. 7.4 lbs.
Chicago, Ill.	36	2.376	32	2.368
Decatur, Ill.	32	2.112	31	2.294
Joliet, Ill.	36	2.376	32	2.368
Peoria, Ill.	33	2.178	31	2.294
Quincy, Ill.	31	2.046	29	2.146
Indianapolis, Ind.	38	2.508	39	2.886
Evansville, Ind.	35	2.310	37	2.738
South Bend, Ind.	44	2.904	**42	**3.108
Detroit, Mich.	64	4.224	51	3.774
Grand Rapids, Mich.	55	3.630	**50	**3.700
Saginaw, Mich.	66	4.356	53	3.922
Green Bay, Wis.	41	2.706	41	3.034
Milwaukee, Wis.	39	2.574	34.5	2.553
LaCrosse, Wis.	37	2.442	37	2.738
Minneapolis-St. Paul.	37	2.442	37	2.738
Duluth, Minn.	41	2.706	41.5	3.071
Mankato, Minn.	37	2.442	37	2.738
Des Moines, Ia.	29	1.914	29	2.146
Davenport, Ia.	33	2.178	31	2.294
Mason City, Ia.	34	2.244	33.5	2.479
St. Louis, Mo.	29	1.914	26.5	1.961
Kansas City, Mo.	22	1.452	22.5	1.665
St. Joseph, Mo.	25	1.650	22.5	1.665
Fargo, N. D.	51	3.366	50.5	3.737
Huron, S. D.	43	2.828	42.5	3.145
Wichita				
From Ponca City	7.5	*0.495	7.5	†0.555
From Tulsa	12.5	*0.825	12.5	†0.925
From Cushing	11	*0.726	11	†0.814

*This rate also includes distillate rate at 6.6 lbs. per gal.

**This rate applies only to residual fuel and gas oil.

†This rate is exclusive of distillate which is based on 6.6 lbs. per gal. from Ponca City, Tulsa and Cushing, Okla., to Wichita. Includes only gas oil and fuel oil.

NOTE: There is no Group 3 rate to Wichita, Kans.

SEABOARD PRICES EXPORT AND COASTWISE

(NOTE—Parenthetical figures after prices indicate number of companies quoting when less than three companies are quoting.

NOTICE—Owing to great demand, refiners generally limit quotations to regular customers and refuse bids, though higher, from others. Refiners' prices and sales shown; bids reported in market leads

Atlantic Coast

(Prices are of refiners, FOB their refineries & their tanker terminals, & of tanker terminal operators FOB their terminals)—Prices Effective Dec. 8

MOTOR GASOLINE

District:	Min. 80 Oct. '39 Research (Max. 2 cc. Lead)	72-74 Oct. (ASTM)	68-70 Oct. (ASTM)
N. Y. Harb.	8.5 – 9	8 – 8.5	8 (1)
N. Y. Harb., barges	8.5	7.9 – 8.5	7.9 (1)
Albany	8.1 – 8.8	....	....
Philadelphia	8 – 8.7	8 – 8.25	8 – 8.2 (1)
Baltimore	7.75 – 8.5	7.75 – 8.25	....
Norfolk	7.62 – 8.5	7.5 – 8.25	7.3 – 7.5 (1)
Wilmington, N. C.	7.5 – 7.8	7.5 – 8 (2)	7.3 – 7.5 (2)
Charleston	7.6 – 7.8	7.5 (1)	6.9 – 7.1 (1)
Savannah	7.87 – 8.2	7.75 (1)	7.6 – 7.8 (2)
Jacksonville	7.87 – 8.2	7.75–7.875 (2)	7.6 – 7.8 (1)
Miami	7.87 – 8.2 (2)	7.75 (1)	7.6 – 7.8 (1)
Tampa	7.75 – 8.2	7.75 (1)	7.6 – 7.8 (1)
Pensacola	7.5 – 7.7 (1)	....	7.1 – 7.3 (1)
Mobile	7.37 – 7.7	....	7.1 – 7.3 (2)
New Orleans	6.75 – 7.37	6.25 – 6.875	....
Portland	8.3 – 9.1	8.6 (1)	....
Boston	8.2 – 9	8.5 (2)	8.5 (1)
Providence	8.2 – 9.1	8.5 (1)	....

FUEL OILS

	KEROSINE and or NO. 1 FUEL	No. 2	No. 3	No. 5	No. 6
N. Y. Harb.	5.3 – 5.5	5.2	5.2	$1.65–1.75 (a)	$1.35 –$1.50
N. Y. Harb., barges	5.2 – 5.5	5.1	5.1	....	....
Albany	5.6	5.4	5.4	$1.95 (1)	$1.55 (1)
Philadelphia	5.4 – 5.8	5.2 – 5.25	5.2 – 5.25	$1.68	$1.35 –$1.50
Baltimore	5.4 – 5.45	5.2 – 5.25	5.2 – 5.25	$1.68 (1)	$1.35 –$1.50
Norfolk	5.4 – 5.5	5.2 – 5.25	5.2 – 5.25 (2)	....	$1.35 (2)
Wilmington, N. C.	5.25 – 5.5	5.2 – 5.25	....	....	....
Charleston	5.4 – 5.5	5.2 (2)	....	....	$1.30 (2)
Savannah	5.25 – 5.5	....	....	....	$1.30 (1)
Jacksonville	5.25 – 5.5	4.75 (2)	4.75 (1)	....	$1.30 (1)
Miami	5.25–5.5 (2)	....	....	....	....
Tampa	5.25 – 5.5	4.75 (2)	....	....	$1.25 (1)
Pensacola	4.8 – 5 (1)	....	....	....	....
Mobile	4.75 – 5	....	....	....	....
New Orleans	4.25 – 4.625	3.875 – 4 (2)	....	$1.68 (1)	$0.85 (2)
Portland	5.5	5.3	5.3 (2)	$1.95 (1)	$1.35 –$1.55
Boston	5.4	5.2	5.2 (2)	$1.65 (2)	$1.35
Providence	5.4	5.2	5.2	$1.60 –$1.65	$1.35

(a) This price is for a straight-run, low pour test No. 5 fuel.

	Bunker C Fuel Ships' bunkers (Ex Lighterage)	Diesel Oil Ships' bunkers (Ex Lighterage)	Diesel Oil Shore Plants	Gas House Gas Oil 28-34 Gravity
N. Y. Harbor	$1.35 –$1.50	$2.15	5.2 –5.3 (2)	5.3 (2)
Albany	$1.55 (1)	$2.35 (1)	5.4 (2)	5.6 (1)
Philadelphia	$1.35 –$1.50	$2.15	....	....
Baltimore	$1.35 –$1.50	$2.15	5.2 (1)	5.2 (1)
Norfolk	$1.35	$2.15	5.2 (1)	5.2 (1)
Charleston	$1.30	$2.15 (2)	5.2 (1)	5.2 (1)
Savannah	$1.30 (1)	$1.99 (1)	....	....
Jacksonville	$1.30 (2)	$1.99–$2.10 (2)	....	....
Tampa	$1.25 (2)	$1.99–$2.10 (2)	....	....
New Orleans	$0.85	$1.65 (2)	4 (1)	4 (1)
Portland	$1.35 –$1.55	$2.23–$2.25	5.3 (1)	5.4 (1)
Boston	$1.35	$2.15 –$2.18	5.2 (2)	5.3 (2)
Providence	$1.35	$2.15 –$2.18	5.2 (1)	5.3 (1)

Wax

(Melting points are AMP. 3° higher than EMP. Export prices FAS c.l. Domestic prices FOB, in bags, c.l. Scale solid; fully refined slabs.)

Prices Effective Dec. 8

Crude Scale:	New Orleans Export	N. Y. Domestic	N. Y. Export
124-6 Yellow	No Price	....	No Price
122-4 White	....	No Price	No Price
124-6 White	No Price	No Price	No Price
Fully Refined:			
123-5	No Price	5.45-5.6 (2&a)	No Price
125-7	No Price	5.6 (2&a)	No Price
128-30	No Price	6	No Price
130-32	No Price	6.25 (2)	No Price
133-5	No Price	6.55	No Price
135-7	No Price	6.8 (1)	No Price
108-11 White Match wax (tight bbls.)			No Price

(a) 0.4c discount generally given for slabs loose.

Naphtha

Prices Effective Dec. 8

	V.M.&P. Naphtha	Mineral Spirits
Baltimore	10–10.5 (2)	9 – 9.5
New York Harbor	10.5 (2)	9.5
Philadelphia district	10.5 (2)	9.5
Boston	11 (2)	10
Providence	11 (1)	10 (2)

Pacific Export

(Quotations at seaboard, Los Angeles, cargo lots, except where otherwise noted.)

Prices Effective	Dec. 8	Dec. 1
375 e.p. blend, 70 oct.	6.375– 6.5	6.375– 6.5
390 e.p. blend, 68 oct.	6.125– 6.25	6.125– 6.25
390 e.p. blend, 66 oct.	5.875– 6	5.875– 6
400 e.p. blend, 65 oct. min.	5.75 – 5.875	5.75 – 5.875
U. S. Motor, under 65 octane	5.25 – 5.5	5.25 – 5.5
38-40 grav. w.w. kero., 150 fire point	4.5 – 5	4.5 – 5
41-43 grav., w.w. kero.	4.75 – 5	4.75 – 5
44-grav., w.w. kero.	5 – 5.5	5 – 5.5
Diesel fuel, 24 & above	$1.25 –$1.30	$1.25 – $1.30
Diesel fuel, under 24	$1.15 –$1.25	$1.15 – $1.25
30-34 grav. diesel (gas oil) Pac. Spec. 200	$1.25 – $1.35	$1.25 – $1.35
Grade C fuel, Pac. Spec. 400	$0.85 – $0.90	$0.85 – $0.90
In Ship's Bunkers, or deep tank lots:		
Diesel fuel, Pac. Spec. 200	$1.35 –$1.45	$1.35 – $1.45
Grade C fuel, Pac. Spec. 400	$0.85 – $0.90	$0.85 – $0.90
Cased Goods: (Per case)		
375-400 e.p. blend, 65 oct. & above	$1.50 –$1.60	$1.50 – $1.60
400 e.p. blend, under 65 oct.	$1.40 –$1.50	$1.40 – $1.50
U. S. Motor	$1.35 –$1.45	$1.35 – $1.45
40-43 grav. w.w. kero., 150 fire point	$1.30 –$1.40	$1.30 – $1.40
Kero., p.w.	$1.25 –$1.35	$1.25 – $1.35

Tanker Rates

(Approximate last paid rates, cents per bbl.; Gulf-N. Atlantic, not East of N. Y.)

Hvy. Crude & Fuel (10 to 19.9 gravity)	No Rate Rep.
Light Crude, (30 grav. or Lighter)	No Rate Rep.
Gasoline	40
Kerosine	No Rate Rep.
No. 2 Fuel	No Rate Rep.

Gulf Coast

(Prices for sales made or firm offers reliably reported for sales pending in cargoes FOB ship at Gulf, for minimum of 20,000 bbls. Prices are by refiners only to other refiners, export agents, or to large tanker terminal operators at the customary trade specifications noted.)

Prices Effective Dec. 8

Domestic

Motor Gasoline	
Min. 80 oct. '39 Research, max. 2cc lead	6.5
60-62, Gravity, Max. 400 e.p.	
72-74 oct. leaded (ASTM)	No Price Rep.
70 oct. unleaded " "	6.25 – 6.375
68 oct. " "	6.25
65 oct. " "	5.875
60 oct. " "	5.625
41-43 w.w. kerosine	4 – 4.5
No. 2 fuel	4 – 4.25
Gas Oil—Less than ½ of 1% sulfur.	
Below 43 diesel index	3.75 – 4.25
43-47 " "	4.125– 4.25
48-52 " "	4.125– 4.25
53-57 " "	4.25 – 4.375
58 & above diesel index	4.375– 4.5
Diesel Oil, ship's bunkers (ex-lighterage)	$1.65 –$1.80
Bunker C, " "	$0.85 –$0.95
Bunker C, cargoes	$0.85 –$0.96

Export

Motor Gasoline	
60-62 Gravity, Max. 400 e.p.	
72-74 oct. leaded (ASTM)	No Price Rep.
70 oct. unleaded " "	6.25 – 6.375
68 oct. " "	6.25
65 oct. " "	5.875
60 oct. " "	5.625
41-43 w.w. kerosine	4 – 4.5
Gas Oil—Less than ½ of 1% sulfur.	
Below 43 diesel index	3.75 – 4.25
43-47 " "	4.125– 4.25
48-52 " "	4.125– 4.25
53-57 " "	4.25 – 4.375
58 & above diesel index	4.375– 4.5

MID-CONTINENT LUBES

(At Gulf; in packages, FAS.; in bulk, FOB terminals)

Dec. 8

	Steel Drums	Bulk
200 vis. D 210 brt. stock	34-35 (2)	28.8 (2)
150 vis. D 210 brt. stock 0-10 p.p.	30–31 (2)	24.8 (2)
10-25 p.p.	29.5 (1)	24.3 (1)
100 vis. D 210 brt. stock 0-10 p.p.	29.5 (1)	24.3 (1)
10-25 p.p.	29 (1)	23.8 (1)
200 vis. No. 3 col. neutral: 0-10 p.p.	22 (1)	16.8 (1)

SOUTH TEXAS LUBES

(Vis. at 100°, c. t. 0, blk. exprt. shp., FOB terminals)

Unfiltered Pale Oils: Vis.	Color	Dec. 8	Dec. 1
100	No. 3	6.25–6.5 (2)	6.25–6.5 (2)
200	No. 3	7.75–8.75 (2)	7.75–8.75 (2)
300	No. 3	8.25–9.25 (2)	8.25–9.25 (2)
500	No. 3½	9.25–10.25 (2)	9.25–10.25 (2)
750	No. 4	9.75–11 (2)	9.75–11 (2)
1200	No. 4	10.25–11.5 (2)	10.25–11.5 (2)
2000	No. 4	12.5 (1)	12.5 (1)

Red Oils: Vis.	Color		
100	No. 5-6	6.5 (1)	6.5 (1)
200	No. 5-6	7.75–8.75 (2)	7.75–8.75 (2)
300	No. 5-6	8.25–9.25 (2)	8.25–9.25 (2)
500	No. 5-6	9.25–10.25 (2)	9.25–10.25 (2)
750	No. 5-6	9.75–11 (2)	9.75–11 (2)
1200	No. 5-6	10.25–11.5 (2)	10.25–11.5 (2)
2000	No. 5-6	11–12.5 (2)	11–12.5 (2)

TANK WAGON PRICES

Commercial or consumer tank car, tank wagon, dealer, and service station prices for gasoline **do not include taxes;** *they do, however, include inspection fees as shown in general footnote. Gasoline taxes, shown in separate column, include 1.5c federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes; kerosine taxes where levied are indicated in footnotes. Dealer discounts are shown in footnotes. These prices in effect Dec. 8, 1941 as posted by principal marketing companies at their headquarters offices, but subject to later correction.*

S. O. New Jersey

Esso (*Regular Grade*)

	Consumer Tank Wagon	Dealer T.W.	Gaso- line Taxes	Kero- sine T.W.
*Atlantic City, N. J.	9	9.5	4.5	7.9
*Newark, N. J.	9	9.5	4.5	7.9
Annapolis, Md.	9.35	9.85	5.5	9.7
Baltimore, Md.	8.75	9.25	5.5	8.7
Cumberland, Md.	10.15	10.65	5.5	10.2
Washington, D. C.	9	9.5	3.5	9.2
Danville, Va.	10.45	10.95	6.5	10.45
Norfolk, Va.	9.25	9.75	6.5	10.2
Petersburg, Va.	9.55	10.05	6.5	11.2
Richmond, Va.	9.55	10.05	6.5	11.2
Roanoke, Va.	10.75	11.25	6.5	10.7
Charleston, W. Va.	11.05	11.55	6.5	11.5
Parkersburg, W. Va.	10.35	10.85	6.5	11.2
Wheeling, W. Va.	10.35	10.85	6.5	11.8
Charlotte, N. C.	10.9	11.4	7.5	9.5
Hickory	11.45	11.95	7.5	10.5
Mt. Airy, N. C.	11.3	11.8	7.5	9.7
Raleigh, N. C.	10.65	11.15	7.5	10.5
Salisbury, N. C.	10.95	11.45	7.5	10.9
Charleston, S. C.	9.75	10.25	7.5	....
Columbia, S. C.	10.6	11.1	7.5	....
Spartanburg, S. C.	11.3	11.8	7.5	....

	Mineral Spirits T.W.	V.M.&P. T.W.
Newark, N. J.	12.5	14
Baltimore, Md.	15	....
Washington, D. C.	15	....

Fuel Oils—T.W.	No. 1	No. 2	No. 3
Atlantic City, N. J.	7.9	7.2	7.2
Newark	7.9	7.2	7.2
Annapolis, Md.	....	7.45	....
Baltimore	7.7	7.2	7.2
Washington, D. C.	8.2	7.45	7.45
Norfolk, Va.	7.9	7	7
Petersburg	8.2	7.2	....
Richmond	8.2	7.2	7.2
Charlotte, N. C.	8.5	8.6	....
Hickory	....	8.2	....
Raleigh	9.5	8.3	....
Charleston, S. C.	....	7.2	....
Columbia	....	8.2	....
Spartanburg	....	9	....

*Effective May 20, '41, minimum retail resale price of 13c posted thru New Jersey.

Discounts:

Esso gasoline—to undivided dealers, 0.5c off dealer t.w.

Kerosine—1c off t.w. price for 25 gals. or more, under contract thru territory (Baltimore city contract not necessary) except no discount in state of New Jersey.

Naphthas—To buyers taking following quantities at one time: Newark, 2c per gal. on 200 gals. or more, less than 200 gals. 0.5c higher price: Baltimore, 2c off on 25 to 100 gals. and 3c on over 100 gals.; Washington, 2c off to contract buyers.

Socony-Vacuum Oil Co., Inc.

Socony Mobilgas (*Regular Grade*)

	Com. Cons. T.W.	Undiv. Dlr. T.W.	Gaso- line Taxes
New York City:			
Manhattan & Bronx	8.9	9.4	*5.5
Kings & Queens	8.9	9.4	*5.5
Richmond	8.5	9	5.5
Albany, N. Y.	8.7	9.2	5.5
Binghamton, N. Y.	9.8	10.3	5.5
Buffalo, N. Y.	9	9.5	5.5
Jamestown, N. Y.	9.2	9.7	5.5
Mt. Vernon, N. Y.	8.9	9.4	5.5
Plattsburg, N. Y.	9.8	10.3	5.5
Rochester, N. Y.	9.6	10.1	5.5
Syracuse, N. Y.	9.3	9.8	5.5
Bridgeport, Conn.	8.8	9.3	4.5
Danbury, Conn.	9.3	9.8	4.5
Hartford, Conn.	9.4	9.9	4.5
New Haven, Conn.	8.8	9.3	4.5
Bangor, Me.	9.5	9.5	5.5
Portland, Me.	9.1	9.6	5.5
Boston, Mass.	8.7	9.2	4.5
Concord, N. H.	10.2	10.7	5.5
Lancaster, N. H.	10.8	11.3	5.5
Manchester, N. H.	10.1	10.6	5.5
Providence, R. I.	8.8	9.3	4.5
Burlington, Vt.	9.7	10.2	5.5
Rutland, Vt.	9.8	10.3	5.5

	Mineral Spirits T.W.	V.M.&P. T.W.
Buffalo, N. Y.	11.9	13.1
New York City	10.5	11.5
Rochester, N. Y.	12.7	13.9
Syracuse, N. Y.	13.5	....
Boston, Mass.	11.5	12.5
Hartford Conn.	13.8	14.8
Providence, R. I.	12.5	13.5

	Kero- sine Yard	Kero- sine T.W.	Mobil- fuel Diesel TC	Mobil- fuel Diesel T.W.	Mobil- heat Fuel Yard	Mobil- heat Fuel T.W.
New York:						
Manhat'n & Bronx	5.6	8	....	7.5	5.5	7.2
Kings & Queens	5.6	8	....	7.5	5.5	7.2
Richmond	5.5	8	....	7.4	5.4	7
Albany	5.8	7.8	5.6	7.6	5.6	7.3
Binghamton	7.1	9.1	....	8.9	6.9	8.4
Buffalo	6.8	8.8	6.7	8.7	6.7	8.2
Jamestown	6.9	8.9	....	8.8	6.8	8.2
Mt. Vernon	5.7	8.2	....	7.6	5.6	7.2
Plattsburg	6.3	8.3	....	8.1	6.1	7.6
Rochester	6.9	8.9	6.4	8.4	6.4	7.9
Syracuse	6.7	8.7	6.3	8.3	6.3	7.8
Conn.:						
Bridgeport	5.8	....	....	....	5.7	7
Danbury	6.3	....	....	....	6	7
Hartford	5.8	....	....	7.7	5.7	7.2
New Haven	5.6	....	....	7.5	5.5	7.1
Maine:						
Bangor	6.1	8.1	5.9	7.9	5.9	7.4
Portland	5.7	8.1	5.5	7.5	5.5	7.2
Mass.:						
Boston	5.8	8	5.6	7.6	5.6	7.2
N. H.:						
Concord	6.6	8.6	....	....	6.7	8.2
Lancaster	7.7	9.7	....	....	7.7	9.2
Manchester	6.7	9	....	....	6.4	7.9
R. I.:						
Providence	5.8	7.8	5.6	7.6	5.6	7.1
Vermont:						
Burlington	6.3	....	6.1	8.1	6.1	7.6
Rutland	6.5	....	....	8.2	6.2	7.7

*Plus 2% city sales tax computed at time of each sale.

Discounts: Diesel—On t.w. deliveries, 0.5c for at least 400 gals.; 1c for full tank truck.

Atlantic Refining

Atlantic White Flash Gasoline (*Regular Grade*)

	Commer- cial T.C.	Dealer T.W.	Gaso- line Taxes	Kero- sine T.W.
Philadelphia, Pa.	8.5	9.5	5.5	10.15
Pittsburgh	9	10	5.5	10.5
Allentown	9	10	5.5	10.5
Erie	9	10	5.5	10.5
Scranton	9	10	5.5	10.5
Altoona	9	10	5.5	10.5
Emporium	9	10	5.5	10.5
Indiana	9	10	5.5	10.5
Uniontown	9	10	5.5	10.5
Harrisburg	9	10	5.5	10.5
Williamsport	9	10	5.5	10.5
Dover, Del.	....	10	5.5	10.5
Wilmington, Del.	....	9.5	5.5	10
Boston, Mass.	....	9.7	4.5	8
Springfield, Mass.	....	10.6	4.5	8.9
Worcester, Mass.	....	10.3	4.5	8.5
Fall River, Mass.	....	9.8	4.5	9
Hartford, Conn.	....	10.4	4.5	7.9
New Haven, Conn.	....	9.8	4.5	9
Providence, R. I.	....	9.8	4.5	8.6
Atlantic City, N. J.	....	9.5	4.5	7.9
Camden, N. J.	....	9.5	4.5	7.9
Trenton, N. J.	....	9.5	4.5	7.9
Annapolis, Md.	....	9.85	5.5	8.7
Baltimore, Md.	....	9.25	5.5	7.7
Hagerstown, Md.	....	10.35	5.5	8.2
Richmond, Va.	....	10.05	6.5	10.2
Wilmington, N. C.	....	10.35	7.5	9.8
Brunswick, Ga.	....	10	7.5	*9
Jacksonville, Fla.	....	10	8.5	10

	Mineral Spirits T.W.†	V.M.&P. T.W.†
Philadelphia, Pa.	10.5	12
Lancaster, Pa.	11.5	13
Pittsburgh, Pa.	12.5	12.5

Fuel Oils—T.W.	1	2	3	5	6
Phila., Pa.	8	7.2	7.2	4.75	3.75
Allentown, Pa.	8.5	7.5	7.5	....	....
Wilmington, Del.	8.00	7.2	7.2	....	....
Springfield, Mass.	8.9	7.6	7.6	....	....
Worcester, Mass.	8.5	7.5	7.5	....	....
Hartford, Conn.	7.9	7.2	7.2	....	....

*Does not include 1c Georgia kerosine tax.

†Mineral Spirits prices also apply to Stoddard Solvent; V.M.&P. prices also apply to Light Cleaners Naphtha.

Discounts:

Gasoline—to undivided dealers, 0.5c off dealer t.w., except Georgia & Florida dealer t.w. and undivided dealer t.w. prices are same.

Kerosine—Thru Penna. & Delaware, 2c off t.w. price on t.w. deliveries of 25 gals. or more at one time.

S. O. Ohio††

***Sohio X-70 Gasoline**

(*Regular Grade*)

	Con- sumer T.W.	**Re- sellers	Gaso- line ‡S.S.	†Gaso- line Taxes	†Kero- sine T.W.
Ohio, Statewide	12	10	13.5	5.5	9
Akron	12	9.5	12	5.5	9
Cincinnati	12	9.5	12.5	5.5	9
Cleveland	12	9.5	12.5	5.5	9
Columbus	12	9.5	12.5	5.5	9
Dayton	12	9.5	12.5	5.5	9
Marietta	12	9.5	12.5	5.5	9
Portsmouth	12	9.5	12.5	5.5	9
Toledo	12	9.5	12.5	5.5	9
Youngstown	12	9.5	12.5	5.5	9

Aviation Gasoline—Statewide

	Consumer T.W.	Gasoline Taxes
Sohio Aviation	14.5	5.5
Esso Ethyl Aviation 74 Oct.	15.5	5.5
Esso Ethyl Aviation 80 Oct.	16.5	5.5
Esso Ethyl Aviation 91 Oct.	17.5	5.5
Esso Ethyl Aviation 100 Oct.	24.5	5.5

	†Naphthas—T.W. Statewide	†Naphthas—T.W. Lucas County
S. R. Solvent	13.5	13.5
D. C. Naphtha	14.5	14.25
V.M.&P. Naphtha	14.5	14.25
Varnolene	14.5	14.25
Sohio Solvent	14.5	14.25

Fuel Oils—T.W.	No. 1	No. 2	No. 3	No. 4
Ohio, Statewide	8	8	7.5	....
Cleveland	10	10	9.5	7.25

*Renown (third-grade) prices are same as X-70 unless otherwise noted.

**Except authorized agents.

†Kerosine prices are ex 1c state tax. Naphtha prices are ex 1.5c federal & 4c state tax.

‡Prices at company-operated stations.

††Statewide prices are subject to exceptions other than those shown.

Discounts:

Esso aviation—on contract to hangar operators and resellers, 2c off consumer t.w.

Fuel Oils—Statewide prices are for t.w. & drum deliveries of 50 gals. or more; prices for deliveries of less than 50 gals. are 0.5c higher. Cleveland Nos. 1, 2, and 3 prices are for bulk deliveries of 5 to 99 gals.; 100 gals. and over are 2c less. Cleveland No. 4 price is for full compartment hose dump only.

Naphthas—to contract consumers off t.w. prices—Statewide: 300 to 999 gals., 0.5c; 1000 to 2499 gals., 0.75c; 2500 to 4999 gals., 1c; 5000 or more gals., 1.5c. Lucas County: Less than 50 gals., tank wagon price; 50 to 249 gals., 0.5c; 250 to 499 gals., 1c; 500 gals. or over, 1.5c.

S. O. Kentucky

Crown Gasoline (*Regular*)
Standard (*Third Grade*)

	†Net Dealer Crown	Standard	Gaso- line Taxes	Kero- sine T.W.
Covington, Ky.	10	9	6.5	9
Lexington, Ky.	11	10	6.5	9
Louisville, Ky.	10.5	9.5	6.5	8.5
Paducah, Ky.	9	8.5	6.5	8.5
Jackson, Miss.	10.5	9.5	7.5	*8.5
Vicksburg, Miss.	10	9	7.5	*8
Birmingham, Ala.	10.5	9.5	*8.5	9
Mobile, Ala.	9.5	7.5	*9.5	8.5
Montgomery, Ala.	10.5	9.5	*9.5	*9
Atlanta, Ga.	11	....	7.5	*9
Augusta, Ga.	11	....	7.5	*8.5
Macon, Ga.	11	....	7.5	*9
Savannah, Ga.	10	....	7.5	*8
Jacksonville, Fla.	10	....	8.5	8
Miami, Fla.	10	....	8.5	8
Pensacola, Fla.	9.5	8.5	*9.5	8
Tampa, Fla.	10	....	8.5	8

*Taxes: In tax column are included these city and county gasoline taxes: Mobile, 2c city; Birmingham, 1c city; Montgomery, 1c city and 1c county; Pensacola, 1c city. Georgia and Montgomery, Ala. have 1c kerosine tax. Mississippi 0.5c, not included in above prices.

†Consumer t.w. prices are same as net dealer prices.

S. O. Indiana

Red Crown (*Regular Grade*)
Blue Crown (*Third Grade*)

	Red Dealer Prices Crown Cons. T.W.	Crown Red Crown	Blue Crown	Gaso- line Taxes	Kero- sine T.W.
Chicago, Ill.	11.6	9.6	8.5	4.5	10.3
Decatur, Ill.	10.9	8.9	8	4.5	9.5
Joliet, Ill.	11.9	9.6	8.5	4.5	10.3

(Continued on next page)

Above prices include these inspection fees on both gasoline and kerosine unless otherwise specified, per gallon:

Alabama 1/40c on gasoline, 1/2c on kerosine; Arkansas 1/20c; Florida 1/8c; Illinois 3/100c; Indiana 1/5c in lots of 25 bbls. or less, 2/25c in lots of more than 25 bbls.; Kansas 1/50c; Louisiana 1/32c; Minnesota 7/200c; Missouri 1/50c; Nebraska 3/100c; Nevada, gasoline 1/20c; North Carolina 1/4c; North Dakota 1/20c; Oklahoma 2/25c; South Carolina 1/8c; South Dakota 1/20c; Tennessee 2/5c; and Wisconsin 3/100c.

Kerosine inspection fees only: Iowa 3/50c; Michigan 1/5c per gal.

TANK WAGON PRICES

Commercial or consumer tank car, tank wagon, dealer, and service station prices for gasoline **do not include taxes;** *they do, however, include inspection fees as shown in general footnote. Gasoline taxes, shown in separate column, include 1.5c federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes; kerosine taxes where levied are indicated in footnotes. Dealer discounts are shown in footnotes. These prices in effect Dec. 8, 1941 as posted by principal marketing companies at their headquarters offices, but subject to later correction.*

S. O. Indiana (Cont'd)

Red Crown (*Regular Grade*)
Blue Crown (*Third Grade*)

	Red Crown Cons. T.W.	Dealer Prices Red Crown	Blue Crown	Gasoline Taxes	Kerosine T.W.
Peoria, Ill.	11.7	9.7	9.7	4.5	10.1
Quincy, Ill.	8.9	7.9	7.9	4.5	10
Indianapolis, Ind.	11.6	9.7	9.6	5.5	*9.8
Evansville, Ind.	11.4	9.9	8.4	5.5	*9.6
South Bend, Ind.	12	10.5	10	5.5	*10.2
Detroit, Mich.	11.4	9.9	9.4	4.5	9.6
Grand Rapids, Mich.	11.4	9.3	9	4.5	9.6
Saginaw, Mich.	11.4	9.9	9.4	4.5	9.6
Green Bay, Wis.	12.2	10.7	10.2	5.5	10.6
Milwaukee, Wis.	12.1	10.6	10.1	5.5	10.5
La Crosse, Wis.	11.9	10.4	9.9	5.5	10.3
Minneapolis-St. Paul	11.9	10.4	9.5	5.5	10.3
Duluth, Minn.	12.2	10.7	10.2	5.5	10.6
Mankato, Minn.	11.9	10.4	9.5	5.5	10.3
Des Moines, Ia.	11.4	7.4	6.9	4.5	*9.8
Davenport, Ia.	11.7	10.2	9.7	4.5	*10.1
Mason City, Ia.	11.7	10.2	9.7	4.5	*10.1
St. Louis, Mo.	8.9	7.4	7.2	*4.5	9.8
Kansas City, Mo.	10.4	8.9	7.9	*4.5	9.4
St. Joseph, Mo.	11.2	9.7	8.7	*4.5	9.6
Fargo, N. D.	12.9	11.4	10.5	5.5	11.3
Huron, S. D.	12.3	10.8	10.3	5.5	10.7
Wichita, Kans.	10.3	8.2	6.5	4.5	8

Stanavo Aviation 73 Octane

Chicago, Ill.	15.7	4.5
Milwaukee, Wis.	15.9	5.5
Minneapolis, Minn.	15.7	5.5
St. Louis, Mo.	15.2	*4.5
Kansas City, Mo.	14.8	*4.5
Fargo, N. D.	16.7	5.5
Huron, S. D.	16.1	5.5

	Oleum Spirits	V.M.&P. Naphtha	Stanisol	*Taxes
(Prices are base prices before discounts)				
Chicago	13.5	13.8	12.8	4.5
Detroit	15.8	15	16.3	4.5
K. C., Mo.	13.3	14.3	13.8	1.5
St. Louis, Mo.	13.7	14.7	13.2	1.5
Milwaukee	14.4	15.4	13.1	5.5
Minneap'lis	14.2	15.2	13.5	5.5

Fuel Oils T. W. Chicago

	Standard Heater Oil
1-99 gals.	9
100-149 gals.	8
150 gals. & over	7.5

	Stanolex Fuel Oil No. 1	Stanolex Furnace Oil
1-99 gals.	8.5	8.5
100-149 gals.	7.5	7.5
150-399 gals.	7.5	7.5
400 gals. & over	7	7

	Stanolex Fuel Oil A	Stanolex Fuel Oil B
1-99 gals.	8	8
100-399 gals.	7	7
400-749 gals.	6	6
750 gals. & over	5.25	5.25

Stanolex Bunker C Fuel Oil

1-399 gals	6.5
400-999 gals	5.5
1000 gals. & over	4.5

Other Points:	Stanolex No. 1	Stanolex Furnace Oil
Indianapolis		
1-99 gals.	...	*8.7
100 gals. & over	...	*7.7
Detroit		
1-99 gals.	...	7.8
100 gals. & over	...	6.8
Milwaukee		
1-99 gals.	...	8.7
100 gals. & over	...	7.7
Minneapolis		
1-99 gals.	...	8.5
100 gals. & over	...	7.5
St. Louis		
1-99 gals.	8.3	7.8
100 gals. & over	7.3	6.8
Kansas City		
1-99 gals.	...	7.6
100 gals. & over	...	6.6

***Taxes:** In gasoline tax column are included these city taxes—Kansas City, St. Joseph, and St. Louis, 1c. Indiana kerosine and fuel oil prices are ex 4c state tax: Iowa kerosine prices are ex 3c state tax. In naphtha tax column are included 1.5c federal tax and state taxes.

S. O. Nebraska

Standard Red Crown Gasoline (*Regular Grade*)

	T.W.	Dealer	Gasoline Taxes	Kerosine T.W.
Omaha	11.4	8.9	6.5	9.8
McCook	12	9.4	6.5	9.5
Norfolk	11.9	10.4	6.5	10.3
North Platte	11	9.9	6.5	10.7
Scottsbluff	12.4	9.5	6.5	9.5

S. O. Louisiana

Esso Gasoline (*Regular Grade*)

	Consumer Tank Wagon	Dealer T.w.	Gasoline Taxes	Kerosine T.W.
New Orleans, La.	8.75	9.25	8.5	*9.5
Baton Rouge, La.	8.75	9.25	8.5	*9.5
Alexandria, La.	8.75	9.25	8.5	*9.5
Lafayette, La.	9	9.5	8.5	*9
Lake Charles, La.	9	9.5	8.5	*11
Shreveport, La.	8.5	9	8.5	*8
Knoxville, Tenn.	11.5	12	8.5	12.5
Memphis, Tenn.	8.75	9.25	8.5	10.5
Chattanooga, Tenn.	10.5	11	8.5	11
Nashville, Tenn.	10.5	11	8.5	10
Bristol, Tenn.	9.75	10.25	8.5	12
Little Rock, Ark.	9.5	10	8	10

*Louisiana kerosine prices are ex 1c state tax.
Discounts:
Esso Gasoline—To undivided dealers, 0.5c off dealer t.w.

Humble Oil & Refining Co.

Humble Motor Fuel (*Regular Grade*)
Thriftane (*Third Grade*)

	Humble *Tank Wagon	Humble Retail	Thriftane *Tank Wagon	Thriftane Retail	Gasoline Taxes
Dallas, Tex.	8.5†	11.5	7.5†	9.5	5.5
Ft. Worth, Tex.	8.5††	10.5	7.5‡	9	5.5
Houston, Tex.	8.5	12.5	7.5	10.5	5.5
San Antonio, Tex.	8.5	12.5	7.5	10.5	5.5

	Kerosine *Tank Wagon	Kerosine Retail
Dallas, Tex.	7	11
Ft. Worth, Tex.	7	11
Houston, Tex.	8	11
San Antonio, Tex.	7	10

74 Oct. Aviation Gasoline, Clear	Tank Car
FOB Baytown, Tex.	8.5

*To all classes of dealers & consumers.
†Less 1c allowance to dealers only.
‡Less 1½c allowance to dealers only.
††Less 2c allowance to dealers only.

The Texas Co.

	Gasoline—Dealer Fire-Chief (*Regular*)	T.W. Indian (*3rd Grade*)	Gasoline Taxes
Dallas, Tex.	8.5*	7.5*	5.5
Ft. Worth, Tex.	8.5*	7.5*	5.5
Wichita Falls, Tex.	8.5	7.5	5.5
Amarillo, Tex.	8.5	7.5	5.5
Tyler, Tex.	8.5*	7.5*	5.5
El Paso, Tex.	11	10.5	5.5
San Angelo, Tex.	8.5	7.5	5.5
Waco, Tex.	8.5*	7*	5.5
Austin, Tex.	8.5	7.5	5.5
Houston, Tex.	8.5	7.5	5.5
San Antonio, Tex.	8.5	7.5	5.5
Port Arthur, Tex.	8.5	7.5	5.5

*Less 1c temporary allowance to all dealers.

Continental Oil Co.

	Conoco Bronz-z-z (*Regular*) †Tank Wagon	Demand (*3rd Grade*)	Gasoline Taxes	Kerosine T.W.
Denver, Col.	10	9	5.5	11
Grand Junction, Col.	12.5	11.5	5.5	12.5
Pueblo, Col.	9.5	8.5	5.5	9.5
Casper, Wyo.	11.5	10.5	5.5	12
Cheyenne, Wyo.	10.5	9.5	5.5	11.5
Billings, Mont.	11.5	10.5	6.5	12.5
Butte, Mont.	10.5	9.5	6.5	13.5
Great Falls, Mont.	10.5	9.5	6.5	12.5
Helena, Mont.	10.5	9.5	6.5	13
Salt Lake City, Utah.	13.5	12.5	5.5	14.5
Boise, Ida.	13.6	12.6	6.5	16.5
Twin Falls, Ida.	14.6	13.6	6.5	17
Albuquerque, N. M.	10.5	9.5	*7	10
Roswell, N. M.	8.5	7.5	*7	8.5
Santa Fe, N. M.	10.5	9.5	*7.5	10
Ft. Smith, Ark.	8.5	5.75	*7	6.5
Little Rock, Ark.	9.25	6.15	8	8
Texarkana, Ark.	8.5	6.5	*5.5	6
Muskogee, Okla.	8.5	7.5	7	8
Oklahoma City, Okla.	8	7.5	7	8
Tulsa, Okla.	8	7.5	7	8

*Taxes: In gasoline tax column are included these city taxes—Albuquerque, & Roswell, 0.5c; Santa Fe, 1c. Texas 4c state tax applies within city limits of Texarkana, Ark.; Okla. 5.5c state tax applies within city limits of Ft. Smith, Ark.
†To consumers & dealers.
Discounts: To dealers only—Cheyenne 1.5c on Bronz-z-z & Demand.

S. O. California

Standard Gasoline (*Regular Grade*)
Flight Gasoline (*Third Grade*)

	Standard Posted Net Tank Truck	Standard Posted Retail	Flight Posted Net Tank Truck	Flight Posted Retail	Gasoline Taxes
San Francisco, Cal.	10	14	9	12	4.5
Los Angeles, Cal.	9.5	13.5	8.5	11.5	4.5
Fresno, Cal.	11	15	10	13	4.5
Phoenix, Ariz.	12	16	10	13	6.5
Reno, Nev.	12	16	11	14	5.5
Portland, Ore.	10.5	14.5	9.5	12.5	6.5
Seattle, Wash.	10.5	14.5	9.5	12.5	6.5
Spokane, Wash.	12.5	16.5	11.5	14.5	6.5
Tacoma, Wash.	10.5	14.5	9.5	12.5	6.5

	Std. Aviation 73 Posted Net Tank Truck	Gasoline Taxes	Kerosine Tank Truck
San Francisco, Cal.	12.5	4.5	11.5
Los Angeles, Cal.	12	4.5	10
Fresno, Cal.	13.5	4.5	12.5
Phoenix, Ariz.	14.5	6.5	12.5
Reno, Nev.	14.5	5.5	13.5
Portland, Ore.	13	6.5	13.5
Seattle, Wash.	13	6.5	13.5
Spokane, Wash.	16	6.5	16.5
Tacoma, Wash.	13	6.5	13.5

Discounts:
To Resale & Commercial Consumers, tank car deliveries 0.25c off posted net tank truck price. Deliveries less than 40 gallons to commercial consumer trade, 4c above posted net tank truck price for Standard and Standard Aviation, 3c above for Flight, except single deliveries to Marine trade only which are billed at posted net tank truck price.

Kerosine—Tank car and truck & trailer deliveries, 3c off posted tank truck price; plant stem deliveries to jobbers, 2.5c off posted tank truck price.

Canada

PRICES OF IMPERIAL OIL, LTD.

Per Imperial Gallon, which is 1.2 U. S. Gallons

3-Star Imperial Gasoline (*Regular Grade*)

	†Gasoline T.W.	*Gasoline Taxes	†Kerosine T.W.
Hamilton, Ont.	17.5	11	18
Toronto, Ont.	17.5	11	18
Brandon, Man.	21	10	23
Winnipeg, Man.	20.5	10	22.5
Regina, Sask.	18	10	20
Saskatoon, Sask.	20.8	10	22.8
Edmonton, Alta.	18.9	10	20.9
Calgary, Alta.	16	10	18
Vancouver, B. C.	15	10	24
Montreal, Que.	17	11	17.5
St. John, N. B.	16.5	13	19
Halifax, N. S.	16.5	13	19

*Includes 3c Federal, and Provincial taxes.
†To divided & undivided dealers.

Tank Wagon Price Changes
(These changes have been made in price tables)

Socony-Vacuum—Mobilgas:
Bangor dealer cut 0.5c Dec. 3.

S. O. Indiana—Red Crown Gasoline:
Peoria dealer up 0.5c Nov. 28.

S. O. Indiana—Blue Crown Gasoline:
Peoria dealer up 0.6c Nov. 28.

Above prices include these inspection fees on both gasoline and kerosine unless otherwise specified, per gallon:
Alabama 1/40c on gasoline, 1/2c on kerosine; Arkansas 1/20c; Florida 1/8c; Illinois 3/100c; Indiana 1/5c in lots of 25 bbls. or less, 2/25c in lots of more than 25 bbls.; Kansas 1/50c; Louisiana 1/32c; Minnesota 7/200c; Missouri 1/50c; Nebraska 2/100c; Nevada, gasoline 1/20c; North Carolina 1/4c; North Dakota 1/20c; Oklahoma 2/25c; South Carolina 1/8c; South Dakota 1/20c; Tennessee 2/5c; and Wisconsin 3/100c.
Kerosine inspection fees only: Iowa 3/50c; Michigan 1/5c per gal.

CRUDE OIL PRICES

Prices in $ per bbl. of 42 U. S. gals. at the well. A. P. I. gravity. Prices are effective as of 7 a. m. of dates shown.

EASTERN & CENTRAL STATES FIELDS

PENNSYLVANIA GRADE

Posted by Jos. Seep Purch. Agency (Aug. 23, '41)
Bradford-Allegany $2.75
Southwest Penna. $2.40
Eureka (West Va.) $2.34
Corning, O. (May 27, '41) $1.31

Posted by The Pennzoil Co. (Aug. 23, '41)
National Transit $2.68*

Posted by Valvoline Pipe Lines (Aug. 23, '41)
Bradford (Elk & McKean Counties, Pa.) $2.75
Warren, Forest, Venango, Clarion & Butler Counties, Pa. $2.68
Alleghany, Beaver, Washington & Greene Counties, Pa. $2.40
West Virginia $2.34
Southeastern Ohio $2.30

*Applies to Cochran, Franklin, Hamilton & Doolittle districts; prices in other lower districts range down to $2.63 per bbl. at well.

MICHIGAN

Posted by Pure Oil Co. (May 27, '41)
Midland, Midland County $1.44
Sherman $1.39

Posted by Simrall Corp. (May 27, '41)
Greendale, Porter, Vernon, Crystal & Wise $1.44
Buckeye, Bentley, Edenville, Beaverton & Monitor (sweet crude type) $1.42
Freeman, Redding, Lincoln & Winterfield $1.39
West Branch-Arenac $1.24
Hamilton-Grout $1.29

Posted by Sohio Corp. (Mich. Div.)
Traverse crude in Allegan, Kent, Ottawa & Van Buren Cos. (June 2, '41) $1.45
Trenton crude, Monroe Co. (June 2, '41) $1.39

Posted by Bay Pipe Line Corp. (May 27, '41)
Saginaw & Wise $1.44
Clare $1.11
Buckeye, Bentley & Kawkawlin $1.42
Adams (June 1, '41) $1.27

ILLINOIS-INDIANA-KENTUCKY-OHIO

Posted by Sohio Corp. (May 21, '41)
Illinois Basin, including Griffin pool $1.37
Carmi Storms, Ill. area $1.32
Birk City, Ky. area $1.32
Corydon, Ky. area, Henderson $1.32

Posted by Ohio Oil Co. (May 21, '41)
Illinois Basin $1.37
Eastern Ill. & Western Ind. 1.22

Posted by Carter Oil Co. (May 21, '41)
Louden, Fayette Co. Ill. $1.37

Posted by Mohawk Oil Lines, Inc. (May 21, '41)
Southern Illinois $1.37

Posted by Ashland Oil & Transp. Co.
Somerset oil in Ash. Lines, Ky.: (June 19, '41)
Big Sandy River $1.38
Kentucky River $1.43

Posted by Owensboro-Ashland Co.
Owensboro, Ky. area (May 21, '41) $1.32

Posted by S. O. Ohio (Sept. 1, '41)
Lima, O. $1.25
Cleveland, Lodi & Chatham (O.) areas $1.30

MID-CONTINENT

OKLAHOMA-KANSAS-NORTH TEXAS

(See below for companies posting and dates)

Gravity	Schedule No. 1	Schedule No. 2	Schedule No. 3	Schedule No. 4
Below 21	$0.85	$0.75	$0.70	$0.78
21-21.9	.87	.78	.73	.80
22-22.9	.89	.81	.76	.82
23-23.9	.91	.84	.79	.84
24-24.9	.93	.87	.82	.86
25-25.9	.95	.90	.85	.88
26-26.9	.97	.93	.88	.90
27-27.9	.99	.96	.91	.92
28-28.9	1.01	.99	.94	.94
29-29.9	1.03	1.02	.97	.96
30-30.9	1.05	1.05	1.00	.98
31-31.9	1.07	1.07	1.02	1.00
32-32.9	1.09	1.09	1.04	1.02
33-33.9	1.11	1.11	1.06	1.04
34-34.9	1.13	1.13	1.08	1.06
35-35.9	1.15	1.15	1.10	1.08
36-36.9	1.17	1.17	1.12	1.10
37-37.9	1.19	1.19	1.14	1.12
38-38.9	1.21	1.21	1.16	1.14
39-39.9	1.23	1.23	1.18	1.16
40 & above	1.25	1.25	1.20	1.18

Above schedules posted by:

No. 1: **S. O. Indiana** May 20, '41 in Okla. & Kans. **Sinclair-Prairie** May 20, '41 in Okla. & Kans. beginning with 25-25.9. **Continental** May 19, '41 in Okla. & Kans. beginning with Below 29 at $1.01. **Texaco** May 19, '41 in Okla. & Kans. beginning with 28-28.9.

No. 2: **Carter** May 20, '41 in Okla. **Shell** May 19, '41 in Okla. & Kans. (exclusive of Carter Co., Okla.) **Magnolia** May 21, '41 in Okla.

No. 3: **Shell** May 19, '41 in Carter Co., Okla.

No. 4: **Stanolind** Nov. 11, '41 in N. Tex. **Texaco** Nov. 13, '41 in N. & N. Central Tex. beginning with 28-28.9. **Sinclair-Prairie** Nov. 11, '41 in N. Central Tex. **Magnolia** Nov. 11, '41 in N. & N. Central Tex. **Continental** Nov. 11, '41 in N. Tex. **Sinclair-Prairie, Magnolia,** and **Continental** schedules begin with Below 29 at $0.94.

TEXAS & NEW MEXICO FIELDS

Posted by Humble Oil & Refining Co.
(May 21, '41, except Panhandle, Tex. July 9, '41)

Gravity	Refugio	Texas Gulf Coast	Mirando	Anahuac	Dickinson	East Central Texas	West Central Texas	Panhandle, Texas	W. Texas & New Mex.	Hawkins Texas
Below 20	$1.08	$1.06	$1.03	$0.98	$0.93	.....	.....	$0.73	$0.70	$0.80
20-20.9	1.10	1.08	1.05	1.00	.95	.....	.....	.75	.72	.82
21-21.9	1.12	1.10	1.07	1.02	.97	.....	.....	.77	.74	.84
22-22.9	1.14	1.12	1.09	1.04	.99	.....	.....	.79	.76	.86
23-23.9	1.16	1.14	1.11	1.06	1.01	.....	.....	.81	.78	.88
24-24.9	1.18	1.16	1.13	1.08	1.03	.....	.....	.83	.80	.90
25 & above	.....	.....	.....	.....	.....	.....	.....	.....	.....	.92
25-25.9	1.20	1.18	1.15	1.10	1.05	$0.97	$0.88	.85	.82	.....
26-26.9	1.22	1.20	1.17	1.12	1.07	.99	.90	.87	.84	.....
27-27.9	1.24	1.22	1.19	1.14	1.09	1.01	.92	.89	.86	.....
28-28.9	1.26	1.24	1.21	1.16	1.11	1.03	.94	.91	.88	.....
29-29.9	1.28	1.26	1.23	1.18	1.13	1.05	.96	.93	.90	.....
30-30.9	1.30	1.28	1.25	1.20	1.15	1.07	.98	.95	.92	.....
31-31.9	1.32	1.30	1.27	1.22	1.17	1.09	1.00	.97	.94	.....
32-32.9	1.34	1.32	1.29	1.24	1.19	1.11	1.02	.99	.96	.....
33-33.9	1.36	1.34	1.31	1.26	1.21	1.13	1.04	1.01	.98	.....
34-34.9	1.38	1.36	1.33	1.28	1.23	1.15	1.06	1.03	1.00	.....
35-35.9	1.40	1.38	1.35	1.30	1.25	1.17	1.08	1.05	1.02	.....
36-36.9	1.42	1.40	1.37	1.32	1.27	1.19	1.10	1.07	1.04	.....
37-37.9	1.44	1.42	1.39	1.34	1.29	1.21	1.12	1.09	1.06	.....
38-38.9	1.46	1.44	1.41	1.36	1.31	1.23	1.14	1.11	1.08	.....
39-39.9	1.48	1.46	1.43	1.38	1.33	1.25	1.16	1.15	1.10	.....
40 & above	1.50	1.48	1.45	1.40	1.35	1.27	1.18	1.15	1.12	.....

Refugio: Includes crude purchased in East White Point, Greta, Melon Creek, O'Connor-McFaddin, Plymouth, Saxet, Taft, & Tom O'Connor fields.

Texas Gulf Coast: Includes crude purchased in Amelia, Clear Lake, Goose Creek, Hastings, Magnet, Mykawa' Mykawa New, Raccoon Bend, South Thompsons, Sugarland, Thompsons, & Webster fields.

Mirando: Includes crude purchased in Blanchard, Bridwell, Colorado, Comitas, Eagle Hill, Escobas, Fitzsimmons, Glen, Government Wells (North & South), Heyser, Hoffman, Kelsey, Kohler, Loma Novia, Lundell, Manila, Mirando Valley, Placedo, Randado, Sarnosa, & Tesoro fields.

Anahuac: Includes crude purchased in Anahuac, Angleton, Cedar Point, Fishers' Reef, Hull (Old & New), Pierce Junction, Red Fish Reef, & Turtle Bay fields.

Dickinson: Includes crude purchased in Dickinson, Gillock, Hardin, League City, & Rowan fields.

East Central Texas: Includes crude purchased in Anderson, Cherokee, Limestone, & Navarro Counties, and Navarro Crossing field.

West Central Texas: Includes crude purchased in Brown, Callahan, Comanche, Eastland, Fisher, Haskell, Jones, Shackelford, Stephens, & Throckmorton Counties.

Panhandle, Texas: Includes crude purchased in Carson, Gray, Hutchinson & Wheeler Counties.

West Texas & New Mexico: Includes crude purchased in Andrews, Crane, Crockett, Ector, Gaines, Glasscock, Howard, Reagan, Upton, Winkler, & Yoakum Counties, Texas; Lea County, N. M.

Hawkins: Includes crude purchased in Hawkins Field, Wood County, Texas.

Conroe $1.43
Tomball 1.40
Van 1.08
Talco 0.79
East Texas & Flag Lake $1.25
Flour Bluff, E. Flour Bluff 1.33
Salt Flat, N. Salt Flat 1.14
Darst Creek, Hilbig, Carroll 1.14
Clark, Zoboroski $1.14
Alice, Benavides (N. Sweden), Sun 1.35
Ben Bolt, Clark-Muil, Tom Graham 1.35
Yates (Pecos) 0.95
La Rosa 1.33

MAGNOLIA PETROLEUM CO.

(May 21, '41)

Panhandle, Tex.—(July 9, '41)—Same as Humble except Magnolia begins with Below 29 at $0.91.

West Texas—In Crane, Upton, Howard, Glasscock, Mitchell, Winkler, Cochran, Hockley, Yoakum & Gaines Cos.—Same as Humble except Magnolia begins with Below 25 at $0.80.

N. Mexico—In Lea Co.—Same as Humble except Magnolia begins with Below 25 at $0.80 & ends with 36 & above at $1.04.

Cass & Panola Cos., Tex.—Below 25 at $0.88, plus 2c per degree of gravity to 40 & above at $1.20.

Mirando, Tex.—Same as Humble.

East Texas $1.25
Darst Creek 1.14
Luling 1.05
Talco ..... .79
Lytton Springs $1.17
Cleveland-Liberty Co. 1.26
Tomball 1.40

SINCLAIR-PRAIRIE OIL MARKETING CO.

Texas Panhandle—(May 23, '41)—Same as Humble except Sinclair-Prairie begins with Below 25 at $0.83.

West Texas & New Mexico—(May 30, '41)—Same as Humble except Sinclair-Prairie begins with Below 25 at $0.80.

Texas Gulf Coast—(May 21, '41)—Same as Humble.

Mexia District, Texas—(May 30, '41)—Same as Humble, East Central Texas, except Sinclair-Prairie also posts Below 25 at $0.95.

East Texas—(May 21, '41) $1.25
Long Lake, Texas—(May 21, '41) 1.23

STANOLIND OIL PURCHASING CO.

(May 21, '41)

Clinton, Tex.—Same as Humble Tex. Gulf Coast except Stanolind begins with Below 21 at $1.08.

Fairbanks, N. Houston & Rosslyn, Tex.—Same as Humble Dickinson schedule.

E. Texas ..... $1.25 **Satsuma & Tomball, Tex.** $1.40

STANOLIND OIL & GAS CO.

(May 21, '41)

W. Beaumont & Spindletop (Jefferson Co., Tex.) **& High Island** (Galveston Co., Tex.)—Same as Humble Tex. Gulf Coast.

Hendrick & Henderson (Winkler Co., Tex.)—Same as Humble West Texas except Stanolind begins with Below 26 at $0.82.

Jay Welder (Calhoun Co., Tex.)—Nov. 14, '41—Same as Humble Anahuac.

THE TEXAS CO.

(May 21, '41)

Panhandle, Tex.—Same as Humble except Texaco begins with 34-34.9 at $1.03.

W. Texas & Lea Co., N. M.—Same as Humble except Texaco posts $0.78 for 23.9 & below and ends with 36 & above at $1.04.

Texas Gulf Coast—Same as Humble except Texaco ends with 34 & above at $1.36.

Duval, Mirando, Tex.—Same as Humble Mirando except Texaco ends with 28-28.9 at $1.21.

Refugio, Tex.—Same as Humble except Texaco ends with 28-28.9 at $1.26.

East Texas $1.25
Darst Creek, Tex. 1.14
Conroe, Tex. $1.43
Hockley & Cochran Cos., Tex. .. .87

SHELL OIL CO., INC.

(May 20, '41)

West Texas & Lea Co., N. M.—Same as Humble except Shell ends with 36 & above at $1.04.

Fisher Co., Tex.—Same as Humble W. Central Texas except Shell begins with Below 25 at $0.86.

East Texas $1.25
Livingston field, Polk Co., Tex. 1.25
Pecos Co., Tex., except Yates Shallow pool .. $0.95
Pecos Co., Yates Shallow pool ..... .82

CONTINENTAL OIL CO.

Carson & Hutchinson Cos., Tex.—(July 9, '41)—Same as Humble Panhandle except Continental begins with Below 29 at $0.91.

Mirando, Tex.—(July 1, '41)—Same as Humble.

Wade City & Clara Driscoll, Tex.—(July 1, '41)—Same as Humble Refugio.

Alfred & Magnolia City, Tex.—(May 21, '41), $1.35.

Eddy Co., N. M.—(May 30, '41)—Same as Humble N. M. schedule except Continental begins with Below 29 at $0.88.

PAN AMERICAN PRODUCTION CO.

(May 21, '41)

Hastings & S. Houston, Tex.—Same as Humble Tex. Gulf Coast except Pan Am. begins with Below 21 at $1.08.

Gillock, Tex.—Same as Humble Dickinson except Pan Am. begins with Below 21 at $0.95.

East Texas $1.25
Cayuga, Tex ..... .90
Goodrich, Tex. (Dec. 1, '41) 1.20

CRUDE OIL PRICES

Prices in $ per bbl. of 42 U. S. gals. at the well. A. P. I. gravity. Prices are effective as of 7 a. m. of dates shown.

CALIFORNIA

Posted by S. O. California, May 23, 1941

(All gravities above those quoted take highest price offered in that field)

Gravity	Signal Hill (Long Beach)	Wilmington	El Segundo	Seal Beach	Huntington Beach	Inglewood	Olinda Brea Canon	Athens-Rosecrans	Torrance	Richfield	Whittier East Coyote (La Habra)	Montebello	West Coyote Hills	Santa Fe Springs	Greeley, Canal, Waseo	Coles Levee	Mountain View	Elk Hills, Buena Vista Hills, Midway-Sunset, Lakeview Area	Lost Hills	Coalinga	Gravity
14-14.9		$0.68			$0.71		$0.70		$0.70	$0.70	$0.70	$0.71						$0.73	$0.73	$0.73	14-14.9
15-15.9		.71			.73	$0.76	.72		.72	.72	.72	.73						.73	.73	.73	15-15.9
16-16.9		.74	$0.79		.79	.79	.75		.74	.73	.75	.75						.73	.75	.73	16-16.9
17-17.9		.78	.82		.82	.82	.78		.77	.76	.78	.78						.75	.78	.73	17-17.9
18-18.9	$0.80	.82	.86		.86	.85	.81		.80	.79	.82	.81						.78	.81	.73	18-18.9
19-19.9	.81	.86	.90		.89	.88	.85		.83	.82	.85	.84					$0.73	.81	.84	.75	19-19.9
20-20.9	.88	.90	.94		.93	.92	.88		.86	.85	.89	.89					.76	.85	.87	.77	20-20.9
21-21.9	.92	.94	.98		.96	.95	.91		.89	.89	.92	.94					.79	.90	.90	.80	21-21.9
22-22.9	.96	.98	1.02	$0.88	.99	.98	.95		.93	.93	.95	.97					.83	.94	.93	.83	22-22.9
23-23.9	1.00	1.02	1.05	.92	1.02	1.01	.98		.97	.98	1.00	.99					.87	.99	.96	.86	23-23.9
24-24.9	1.03	1.06	1.07	.97	1.05	1.04	1.01		1.01	1.02	1.03	.94	$0.99				.90	1.03	.99	.89	24-24.9
25-25.9	1.07	1.09	1.10	1.01	1.08	1.07	1.04		1.05	1.06	1.07	.98	1.02				.94	1.07	1.01	.92	25-25.9
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27-27.9	1.15	1.15	1.15	1.10	1.14	1.14	1.11		1.13		1.15	1.05	1.10	$1.04			1.01	1.15	1.07	.98	27-27.9
28-28.9	1.18	1.18	1.17	1.15	1.17	1.17	1.14		1.17			1.08	1.13	1.08			1.04	1.19	1.10	1.00	28-28.9
29-29.9	1.20	1.21		1.19	1.20	1.20		$1.17				1.12	1.17	1.12			1.07	1.24	1.13	1.02	29-29.9
30-30.9	1.23	1.24			1.23	1.22		1.21		**Elwood**		1.15	1.21	1.15	$1.01	$1.09	1.10	1.28	1.16	1.04	30-30.9
31-31.9						1.24		1.25		**Terrace**		1.19	1.24	1.19	1.04	1.12	1.14			1.06	31-31.9
32-32.9								1.29		**F.o.b. Ship**		1.23	1.28	1.23	1.07	1.14	1.17			1.09	32-32.9
33-33.9								1.32		$1.22		1.27		1.26	1.10	1.17				1.11	33-33.9
34-34.9	**Kettleman Hills**							1.36		1.25		1.31		1.30	1.13	1.20				1.13	34-34.9
35-35.9	$1.23									1.28		1.35			1.16	1.22					35-35.9
36-36.9	1.26											1.39			1.19	1.25					36-36.9
37-37.9	1.29											1.43			1.22						37-37.9
38-38.9												1.47			1.25						38-38.9
39-39.9												1.51									39-39.9
40-40.9												1.53									40-40.9

Playa Del Rey: (FOB Standard Pipe Line) 20-20.9, $0.80; 21-21.9, $0.84; 22-22.9, $0.87.
Wheeler Ridge: 22-22.9, $0.76; 23-23.9, $0.80; 24-24.9, $0.83.
Newhall, Kern River, Kern Front, McKittrick & Round Mountain: 14-14.9, $0.73.

LOUISIANA-ARKANSAS

Posted by S. O. Louisiana, May 22, '41

Gravity	Atlanta, Ark. et al.	De Soto, La. et al.	Rodessa, La. et al.	Bunkie, La. et al.	Darrow, La. et al.	University, La. (Baton Rouge)
40 & above	$1.08	$1.18	$1.20	$1.30	$1.30	
39-39.9	1.06	1.16	1.18	1.28	1.28	
38-38.9	1.04	1.14	1.16	1.26	1.26	
37-37.9	1.02	1.12	1.14	1.24	1.24	
36-36.9	1.00	1.10	1.12	1.22	1.22	
35-35.9	.98	1.08	1.10	1.20	1.20	
35 & above						$1.36
34-34.9	.96	1.06	1.08	1.18	1.18	1.34
33-33.9	.94	1.04	1.06	1.16	1.16	1.32
32-32.9	.92	1.02	1.04	1.14	1.14	1.30
31-31.9	.90	1.00	1.02	1.12	1.12	1.28
30 & below						1.26
30-30.9	.88	.98	1.00	1.10	1.10	
29-29.9	.86	.96	.98	1.08	1.08	
28-28.9	.84	.94	.96	1.06	1.06	
27-27.9	.82	.92	.94	1.04	1.04	
26-26.9	.80	.90	.92	1.02	1.02	
25-25.9	.78	.88	.90	1.00	1.00	
Below 25		.86	.88	.98		
24-24.9	.76		.88		.98	
23-23.9	.74		.86		.96	
22-22.9	.72		.84		.94	
21-21.9	.70		.82		.92	
Below 21	.68		.80		.90	

Atlanta schedule includes Buckner, Lewisville, Magnolia, Village & Schuler (Jones Sand), Ark.

De Soto schedule includes Sabine, Fouke, Homer, Miller Co., Nebo & Sugar Creek.

Rodessa schedule includes Cotton Valley & Shreveport (Cross Lake) ending with Below 25 at $0.88; Anse La Butte (Aug. 1, '41); Caddo (Oct. 15, 1941).

Bunkie schedule includes Eola, Olla, & South Olla.

Darrow schedule includes Bayou Mallet, Choctaw, Jeanerette, Lirette, N. & S. Crowley, Port Allen, Port Barre, Potash, Roanoke, & St. Martinville.

Big Creek, Dorcheat, McKamie (Sour)	$1.15
Heavy Smackover Crude	.83
Cotton Valley Distillate (Sept. 1, '41)	1.40
Cotton Valley (Holloway Sand Crude)	1.25
Lisbon Distillate	1.20

(Continued next column)

LOUISIANA-ARKANSAS *(Cont'd)*

Posted by Shell Oil Co., Inc. (May 20, '41)

Gravity	Iowa	Roanoke	Gibson
Below 20	$0.99	$0.94	$0.89
20-20.9	1.01	.96	.91
21-21.9	1.03	.98	.93
22-22.9	1.05	1.00	.95
23-23.9	1.07	1.02	.97
24-24.9	1.09	1.04	.99
25-25.9	1.11	1.06	1.01
26-26.9	1.13	1.08	1.03
27-27.9	1.15	1.10	1.05
28-28.9	1.17	1.12	1.07
29-29.9	1.19	1.14	1.09
30-30.9	1.21	1.16	1.11
31-31.9	1.23	1.18	1.13
32-32.9	1.25	1.20	1.15
33-33.9	1.27	1.22	1.17
34 & above	1.29	1.24	1.19

Iowa schedule includes Black Bayou & White Castle, La. fields.

Roanoke schedule includes Chalkley, La. field.

Gibson schedule includes S. Houma, Hester & W. Lake Verret, La. fields.

Happytown field, St. Martin Par., La. $1.15

Posted by Arkansas Fuel Oil Corp.

Urania, La. (May 22, '41) $1.15

Posted by Continental Oil Co. (May 21, '41)

Tepetate, La.	$1.18
Ville Platte, La.	1.20
Lake Arthur, La.	1.18
Ritchie, La. (Sept. 1, '41)	1.08

Abbeville, La.

Below 36	$1.07	37-37.9	$1.11	39-39.9	$1.15
36-36.9	1.09	38-38.9	1.13	40 & above	1.17

CANADIAN FIELDS

Posted by Imperial Oil Limited

Western Ontario (Nov. 6, 1939)

Petrolia	$2.10	Oil Springs	$2.17

Turner Valley Crude Oil (July 16, '41)

(Prices FOB producer's tankage)

33-33.9	$1.35	44-44.9	$1.57	55-55.9	$1.79
34-34.9	1.37	45-45.9	1.59	56-56.9	1.81
35-35.9	1.39	46-46.9	1.61	57-57.9	1.83
36-36.9	1.41	47-47.9	1.63	58-58.9	1.85
37-37.9	1.43	48-48.9	1.65	59-59.9	1.87
38-38.9	1.45	49-49.9	1.67	60-60.9	1.89
39-39.9	1.47	50-50.9	1.69	61-61.9	1.91
40-40.9	1.49	51-51.9	1.71	62-62.9	1.93
41-41.9	1.51	52-52.9	1.73	63-63.9	1.95
42-42.9	1.53	53-53.9	1.75	64 & over	1.97
43-43.9	1.55	54-54.9	1.77		

Absorption Gasoline (July 16, '41)

90% Rec., 20 lb. Reid v.p.	$2.28
90% Rec. 17 lb. Reid v.p.	2.44

ROCKY MOUNTAIN FIELDS

Posted by Stanolind Oil & Gas Co. (May 20, '41)

Salt Creek (except Tensleep crude), Midway & Dutton Creek, Wyo.

Below 29	$0.96	32-32.9	$1.04	36-36.9	$1.12
29-29.9	.98	33-33.9	1.06	37-37.9	1.14
30-30.9	1.00	34-34.9	1.08	38-38.9	1.16
31-31.9	1.02	35-35.9	1.10	39-39.9	1.18
				40 & above	1.20

Wyoming:		Wyoming:	
Tensleep Crude	$0.6785	Grass Creek Light	$1.09
Frannie Light	.70	Grass Creek Heavy	.50
Frannie Heavy	.47	Elk Basin	1.09
Hamilton Dome	.15	Hes, Colo	1.07

Posted by Ohio Oil Co. (May 21, '41)

Elk Basin, Wyo.	$1.09
Grass Creek, Wyo., Light	1.09
Rock Creek, Wyo.	1.15
Lance Creek, Wyo., (July 1, '41)	1.12

Posted by Continental Oil Co. (May 21, '41)

Ft. Collins & Wellington, Col.

Below 29	$0.96	32-32.9	$1.04	36-36.9	$1.12
29-29.9	.98	33-33.9	1.06	37-37.9	1.14
30-30.9	1.00	34-34.9	1.08	38-38.9	1.16
31-31.9	1.02	35-35.9	1.10	39-39.9	1.18
				40 & above	1.20

Canon City & Florence, Col.	$1.05	Big Muddy, Wyo., (May 30, '41)	$1.08
Cat Creek, Mont.	1.15	Lance Creek, Wyo., July 1, '41	$1.12

Posted by Independent Pipe Line Co. (Aug. 1, '41)

Falls City, Neb., field price	$0.90
Falls City, Neb., loaded in tank cars	0.95
Shubert, Neb., loaded in tank cars	0.97

SOUTHEASTERN FIELDS

Posted by Allied Pipe Line Corp. (Oct. 16, '41)

Tinsley (Miss.) Crude			
24-24.9	$0.745	32-32.9	$0.905
25-25.9	.765	33-33.9	.925
26-26.9	.785	34-34.9	.945
27-27.9	.805	35-35.9	.965
28-28.9	.825	36-36.9	.985
29-29.9	.845	37-37.9	1.005
30-30.9	.865	38-38.9	1.025
31-31.9	.885	39-39.9	1.045
		40 & above	1.065

CLASSIFIED

Address all Blind Box Number ads to National Petroleum News, 530 Penton Building, Cleveland, Ohio, unless otherwise specified.

For Sale

One 1941 WA 26 5 to 8 ton White tractor, air brakes, 4380 gal. casing head semi-trailer, 5 compartments, good as new, 30,000 miles. Mack's Tire and Battery, 701 E. Main Street, Shawnee, Oklahoma.

Semi-Streamlined 1330 gallon Quaker City Truck Tank, Safety Valves, 2 inch Piping. Full Skirted. Located in Central Pennsylvania. Can be had immediately. Box No. 1002.

3 steel storage tanks like new, ready for removal, one 2,500,000; one 1,000,000; one 750,000 gallons. Also up to date 1500 gallon truck, ticket printer. Box No. 1004.

Wanted to Buy

Bulk Storage Tanks horizontal type for either above ground or underground installation. Must be in Ohio or close by. Furnish full details to Red Head Oil Company, Wooster, Ohio.

Business Opportunities

ESTABLISHED OIL BROKER WANTED

One of oldest brands in Pennsylvania oil industry wants oil broker to handle states of Tennessee, Mississippi, Alabama, Georgia, and Florida. Lowest Prices. Highest quality Emblem Oil.

Box No. 1003.

Business Opportunities

Established West-Coast marketer now selling legitimate refiners, compounders, blenders and jobbers, wants reputable quality line of Mid-Continent bright stocks, neutrals, trade-marked oils and greases on exclusive basis. Box No. 988.

Established small wholesale oil business located in Virginia. Good opportunity for person to enter business with small capital. Terms arranged. Approximately $5000.00 required. Box No. 1001.

If you want to buy or sell a used truck, a bulk plant or other good used oil equipment, a classified advertisement in **National Petroleum News** will do the job for you. The rates are low. See the item below for rates and further information.

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·PERSONALS·

J. M. Linehan, Tulsa, has been appointed general superintendent of the Mid-continent Pipe Line Co., succeeding **J. A. Beyhan,** who died recently. Although he is only 39 years old, the new superintendent has 21 years of pipeline experience, having followed in the footsteps of his father, **J. J. Linehan,** who is superintendent of the pipeline division of Sinclair Refining Co.

* * *

Appointment of **G. L. "Jerry" Brennan** as manager of the liquefied petroleum gas division of Warren Petroleum Corp., has been announced by **Howard E. Felt,** Warren's vice-president in charge of the division.

Mr. Brennan has resigned as assistant manager of the special products department of Phillips Petroleum Co. and takes up his new job with Warren Dec. 1.

A North Dakotan, the new l.p.g. manager was born at Devils Lake, graduated from the local high school and received his bachelor of science degree in mining engineering at the University of North Dakota. He is married and has two daughters.

Warren's l.p.g. division, in addition to Mr. Felt and Mr. Brennan is composed of **Fred J. LaFortune, P. G. Hoagland, Allen S. James** and **Kenneth T. White.**

G. L. Brennan

E. DeGolyer

E. DeGolyer is listed as author of an introductory essay "Zuni and Cushing" in the limited edition of the book titled "My Adventures in Zuni", the accounts of research into Zuni Indian culture by Frank Hamilton Cushing way back in 1879.

In speaking of Author DeGolyer's contribution to the book, the preview states that "The appearance of the volume containing Cushing's work is the more important because of an introductory essay, itself a contribution of genuine value, by E. DeGolyer, southwestern collector and scholar."

This is the same Mr. DeGolyer who is listed on NPN's Washington Directory of oil agency headquarters as director of conservation for the Office of Petroleum Co-ordinator. He is also active in Interstate Oil Compact Commission committee work.

* * *

Dr. Francis A. Spencer, son of Frank E. Spencer, head of Spencer Petroleum Co., Chicago, is author of a book published under the auspices of Brookings Institution of Washington, entitled, "Air Mail Payment and the Government". It discusses the problems involved in determining amounts of remuneration to the airlines for carrying the mails, and contains an analysis of all the decisions of the Civil Aeronautics Board. This study was undertaken in preparing for a doctor's degree at Princeton University and was deemed important enough to be given wider scope by Brookings Institution. Dr. Spencer is now a member of the staff of the CAB.

Dr. Gustav Egloff, Chicago, research director for Universal Oil Products Co., made a round of speeches in Kentucky early this month before going to New York to address the Society of Chemical Industry and the American Chemical Society. On Dec. 3, Dr. Egloff spoke on "Oil and War" before the Louisville, Ky., section of the American Chemical Society and on the same day discussed "Motor Fuels for Modern Airplanes" with the faculty and students of the University of Louisville. The next day, he lectured at the University of Kentucky at Lexington and arrived in New York for the Chemical Exposition a day later.

* * *

William I. Robinson, Tulsa, former assistant general counsel for Midstates Oil Corp., is now affiliated with Office of Price Administration as a litigation attorney.

* * *

When **R. C. McKee,** Chicago, assistant advertising manager for Indiana Standard, took leave of absence to join the U. S. Navy as a public relations officer, he also became a character in a comic strip. The strip, "Don Winslow", distributed by Bell Syndicate, Inc., is written by Frank V. Martinek, Indiana Standard assistant vice-president. Mr. Martinek's modern Horatio Alger's character "Don Winslow", in addition to newspapers, has appeared in movies, books and on the radio. In the accompanying cut, Mr. McKee, now named "Mac McKee", meets the commander of the fleet as he goes out to get the "real story of America's fast-expanding Navy."

Lead Cut Means Reducing Octane Of Regular Gasoline 3-5 Points

By GEORGE B. MURPHY, Technical Editor NPN

One of the most serious questions confronting refiners today is what will the restriction on the use of tetraethyl lead over the country mean in the octane rating of regular grade gasoline sold at filling stations?

How will each individual company operate, their refineries with perhaps 30% less lead than the amount required during the past year?

These are the questions that all refining companies are debating since it was announced at Washington that restrictions on lead were inevitable. While the method for securing the retardation has not been announced from Washington as this is written, some companies will be benefitted and some harmed by whatever method is adopted. Some refiners, who have been contributing a large portion of their high antiknock gasoline stocks for aviation purposes, require a greater quantity of lead today than they did one year ago, while the lead requirement of others is reduced because of lead savings effected by the installation of improved refinery methods.

It is important to note that, whatever methods are employed to reduce the amount of lead refiners use, they will have to maintain the volume of gasoline they are now manufacturing and some will be required to increase their volume in 1942. They cannot meet the present lead problem by reducing their yield of gasoline from the crude, in line with the proposed reduction in their lead supply. It is also important to note that the government's requirements for lead may increase, rather than diminish, as is indicated by the recent announcement from Washington that the maximum lead content of 100 octane number aviation gasoline is to be increased from 3 to 4 ccs.

In an attempt to obtain the opinion of refiners in the east, the middle west, and in the Mid-Continent, the staff of Refining Technology interviewed executives and technical men representing small, medium, and large sized refinery companies. The majority of opinions seem to indicate that a reduction in octane number would be necessary, which may amount to as much as 5 points in the east and perhaps 3 points in the middle west for regular grade. Based upon the average octane number of 74.4 reported by the Bureau of Mines in their 1940-41 survey, this may mean a return to the level of 70-72 for the winter of 1941-42.

The oil companies interviewed feel the problem is one for the manufacturing and marketing departments of the individual company, meeting competition in their own sales area as best they can, with what lead limitation they are required to take. They believe an over-all ruling from Washington for all refiners cannot help but be unfair to some and favorable to others.

For illustration, if it were left to refiners to meet the present situation in their own way, some plants might find a substitute for lead, in part at least, by increasing the percentage of cracked or reformed gasoline in their regular grade product. For those not in a position to operate cracking units of any type, the problems will be difficult, but selection of crude, use of natural and casinghead gasoline, reduction of end point and utilization of some of the less effective organic anti-knock compounds may provide temporary relief.

Assuming that we continue to manufacture the present number of grades of gasoline, there are three methods that may be decided upon at Washington or elsewhere for putting the lead restriction into effect.

A. What will it mean if the Ethyl Gasoline Corp. plan is used of giving each refiner 70% of last year's supply and letting him work out his own salvation? Some unfairness might develop for those plants not in a position to maintain the competitive octane level, and especially to those using the least amount of lead, since the value of lead decreases with the quantity used. For example, the first cc in a straight-run gasoline may increase the octane number 10 points, while the second cc may only increase it 5—and the third, only 2.5 points.

B. What will it mean if a flat ceiling is put on octane of regular grade gasoline? This will penalize the plants that now have an advantage in selling a higher octane regular gasoline than other companies, or those that use a different method for determining the octane rating of their gasoline than others.

C. What will it mean if all companies are required to reduce their octane number the same amount—say 3 points to 5 points? There would be great difficulty in policing this regulation, but it would allow the companies now having an advantage in higher octane number to maintain it.

Small Refiner

The small refiner is considered to be one with some cracking installation. No topping plant operators were interviewed since it is believed that most of them, even with the maximum allowable lead, are not selling a regular grade product as high in octane number as the regular grade average of 74.4 and the volume percentage of their business is considered small.

One small refiner stated that the reduction in lead allowables for the next few months would not affect the quality of his gasoline, since he had looked forward to it

and was prepared. He has increased the cracking and reforming capacity of the refinery and reduced the end point of his straight run gasoline. His company has not been able to find a lead substitute and has noticed no reduction in octane number of regular grade gasolines in their vicinity. This company is in favor of eliminating third-grade gasoline, which has to be leaded. The lead susceptibility of their gasolines could not be increased by any of the methods they had investigated.

Medium Size Refiners

A refiner in the Mid-Continent area stated that based upon last year's allowables for tetraethyl lead, his position was favorable. During 1941 he had revamped and installed new cracking, reforming, and polymerization units with the objective of reducing lead cost. The result of this year's development indicated that in 1942 the company would require 1cc less of tetraethyl lead per gallon. Another development that assisted this company was a treating process which reduced the lead requirement for their finished gasoline.

Another averaged sized refiner trusted that the industry would go to only one grade, which would eliminate his necessity for pump lines and tanks to segregate his stocks into four grades. In addition, he visualized an added economic benefit to the smaller companies who are not in a position to meet the government requirement for high octane base stocks or blending agents. This refiner had greatly increased his capacity for gasoline, and therefore needs larger quantity of lead than he purchased a year ago. He stated he has found no substitutes for tetraethyl lead except through increased reforming capacity.

Large Refiners

Larger companies are frankly worried about the lead situation. One official stated that, based upon a 30% reduction of lead receipts, their regular grade would have to be reduced 3 to 5 points in octane number. He believes that government orders might be issued requiring all refiners to reduce their anti-knock value by this amount, which would preserve the present relative advantage the various companies enjoy.

He believes that an arbitrary ceiling for octane number would be unfair to those possessing that advantage. His thought was that, in addition to restricting lead, the government should call on refiners to give up selected crudes and that it also should call on refiners having new plants to turn out a greater relative volume of high-octane gasoline for national defense purposes. Thus, the refiner possessing high-octane crudes and newer catalytic cracking processes should be called upon to give up that advantage and to reduce the anti-knock rating of his regular grade gasoline in line with other companies. This refiner believes that any ruling by the government should be equitable to all refiners so that one might not increase his business by taking advantage of the higher octane level of his gasoline products.

A well known technical executive in the east, for a large company, stated that his company was then in executive session to determine the possibility of meeting octane number requirements with less lead. The conclusion seemed to be that, if maintenance of volume is required, a reduction of octane number of their regular grade gasoline would be necessary. He stated that most refiners in the east were discussing this subject and the three opinions he had heard most were as follows:

1. Most companies are up in the air on lead allocation, which they feel to be unfair to some. In his opinion, the Ethyl basis is not equitable, since some companies contributing to national defense will require more lead than previously.

2. Many suggest that the government fix an octane level. This he believes is not practical, because there is no dependable method for rating an octane number that will be fair to all.

3. Many are considering the possibility that each refiner will be compelled by the government to drop his octane number a few points. This he believes will be difficult, since it will depend so much upon the co-operation of each individual company to be effective.

He believes that the only solution is to educate the public that 68-octane ASTM is a suitable regular grade gasoline for most automobiles, and that car adjustments to meet this quality should be made by owners of the automobiles which at present require 74 to 76 octane. He believes that a limited amount of premium gasoline should be sold and that no leaded third-grade be allowed. Companies to whom lead reduction will not offer a hardship should be made to lower their octane level to that of competitors. In his opinion, no other properties of regular grade gasoline will be affected if octane number were reduced 2 to 3 points.

His opinion was definite that the government should keep its hands off any attempt to regulate the quality of gasoline used by the general public, as competition among refiners will keep the octane value of regular grade gasoline as high as it is practical, under what lead restrictions are necessary.

The large refiners on the Gulf Coast believe allocation should be made on the basis of the percentage of lead consumption by each refiner during the last 6 months. They favored the minimum octane reduction necessary, but gave no information as to what this reduction might be. Distribution in equality should be taken care of by a pool set up for their district 3, they believe. District 5 marketers, on the other hand, are in favor of eliminating third-grade, reducing regular to 70 and reducing premium to 81 octane.

Looking upon the picture as a whole, it appears impossible to obtain a solution of this problem for the industry as a whole. Each refiner must make a decision based upon his own particular marketing requirements. The average of opinion seems to be that a reduction in regular grade gasoline to 72 octane maximum is in order.

More on the lead restriction in the News Section of this NPN. See page 9.

Another article of importance to refiners. New process of Standard Oil Co. of Indiana, for converting low octane number naphtha into the base stocks used in making 100-octane aviation gasoline, is to be made immediately available to other oil companies. See page 15.

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The Testing Of Heavy-Duty Motor Oils

By Harry C. Mougey* and Joseph A. Moller**

Presented at the American Petroleum Institute Meeting, San Francisco, Nov. 3-7, 1941

Data on the evaluation of motor oils in heavy duty service are presented, this data resulting from a series of tests run by a number of oil company and automotive laboratories, in a program to develop a standard method of laboratory engine test procedure to determine oxidation and corrosion characteristics of the oils. The inhibiting effect on the oil of certain fuel ingredients is discussed, also the effect of different air-fuel ratios.

The test procedure proposed is a modification of the present 67-hour Chevrolet Varnish test. It involves the use of a current model Chevrolet engine operated at 30 H. P., at 3150 R.P.M., for 36 hours, with the water out at 200° F. and the oil sump temperature held at 280° F., with a 14.5 to 1 air-fuel ratio.

The proposed test is the work of a special committee of the Society of Automotive Engineers, of which Messrs. Mougey and Moller, authors of the accompanying paper, are chairmen respectively for the automotive and oil groups. Full details of the test procedure will likely be made available by the committee in the near future. The paper is published as presented, except as parts omitted are indicated.

DURING the past several years the oxidation and corrosive characteristics of lubricating oils have been studied by means of various laboratory devices and tests. However, since correlation with field results was not always obtained, these tests, whether considered individually or collectively, left much to be desired. While this was true insofar as the service conditions for engines then in the field were concerned, newer types of engines began to appear which, because of the additional severity of operating conditions, could not be correlated with the then used laboratory tests.

In discussing field results, it should be remembered that these results were obtained with certain oils under a variety of operating conditions in actual service. Therefore these oils, of known performance, constituted ideal test specimens for, first, judging the merits of a test device as to its ability to predict, from laboratory test results, the performance of these and other oils in service. Secondly, these same oils,

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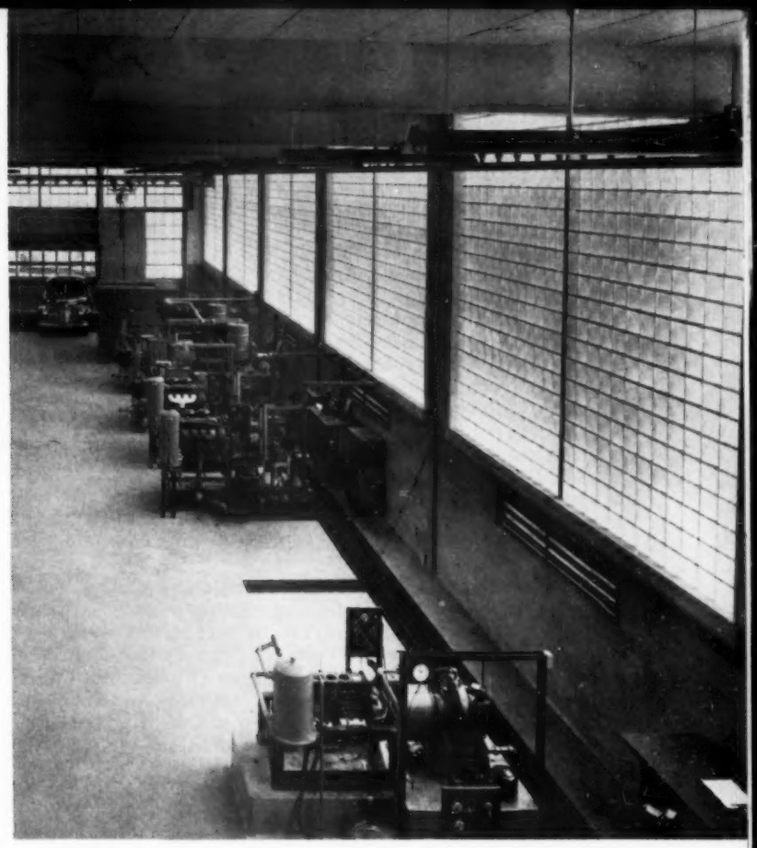

New engine laboratory of Lubri-Zol Corp., Cleveland

once the laboratory test method is established, would lend themselves to a still further, and perhaps even more essential service, in that test results obtained from them would form a pattern upon, or against, which the field performance of an unknown oil might be evaluated from laboratory tests.

In the meantime, one engine builder who had had the problem of lubricating oil deposition to contend with, perhaps a little earlier than some of the other engine designers, had developed a series of engine tests to define for him, the petroleum supplier, and the user, the ability of an oil to give satisfactory service. These tests were somewhat cumbersome, but as long as only one manufacturer required them, no one suffered very much. However, shortly thereafter, another engine manufacturer began to run into some troubles of his own in the field. For him to define the ability of an oil to give satisfactory performance in service, it was necessary to set up another type of test, using another engine and a different procedure.

About that time, yet another make of engine began having difficulty with the ordinary run of the mine lubricating oils, and again it was necessary to have a test set up which would define a lubricant for satisfactory service, using still another engine and a different procedure.

Obviously, it would be but a question of time before other engine manufacturers would design newer and different types of engines requiring yet more test programs, and perhaps resulting in yet further specialization of lubricating oils for each type of engine. Such a series of test programs, which would, perforce, have to be conducted by each engine builder for all oils and by each petroleum refiner for all engines, would be prohibitive from the point of view of the expense and the time involved.

Probably the one reason why all of this was taking place was because the manufacturer of lubricating oils lacked the means of defining, or describing, in any interpretable or understandable language for the engine designer, the user, or himself, the physical limitations which should be imposed upon the designer for his design with reference to the use of the oil itself.

At about this stage of events, two sub-committees, of Sub-Division B of the Lubricants Division of the Society of Automotive Engineers, had been meeting individually and collectively in an effort to describe both by definition and

specification, heavy duty conditions. The thought was, of course, that, if a satisfactory description of heavy duty conditions could be evolved, this definition, used as a specification, could then be applied to oils satisfactorily meeting these conditions. Further, that since the conditions were probably more susceptible of definition and description in terms with which both the engine designer and petroleum refiner were already familiar, such a definition for heavy duty motor oils could more easily be understood and applied by both industries than could a description of the oil alone in terms of some yet to be developed nomenclature.

Fortunately, for all concerned, sufficient work had already been done so that most of the desirable, and the undesirable, properties of heavy duty motor oils were at least generally understood. The only problem was to define, describe, and compare them by means of some common yardstick.

It was generally conceded that the Caterpillar series of tests, as then outlined, quite adequately defined and described the detergent and dispersive properties of the oil; that the General Motors Series 71, five hundred hour test, defined and described to some degree the combination of both the detergent and dispersive properties, together with the oxidation characteristics of the oil; and, that the Chevrolet Varnish procedure placed the greatest emphasis on the oxidation characteristics of the oil.

In other words, the Caterpillar series tested primarily the detergent and dispersive characteristics of the oil, while the Chevrolet Varnish procedure tested the oxidation characteristics.

Probably the most important remaining characteristic, from the point of view of heavy duty operating conditions, which had to be considered, was the corrosive characteristic of the oil. Both the Caterpillar series and the General Motors Series 71 test had provisions for the study of corrosion already incorporated in them.

The Chevrolet test was probably the most desirable test to be used for several reasons. Many laboratories were already set up to run these tests. The engines were relatively inexpensive, and, since the engines were production models, replacement parts were relatively inexpensive and easy to obtain. However, all laboratories were not obtaining comparable results. On the one hand, it was obvious that a considerable amount of work had to be done so that discrepancies in results obtained by different laboratories could be ironed out before the test could be considered as a common yardstick for the definition of the oxidation characteristics of oils under heavy duty conditions. On the other hand, if this type of correlation between laboratories could be accomplished for one set of conditions, it could then be done for any set of operating conditions within limits yet to be determined. From many points of view, a complete study of the Chevrolet Varnish test and the procedure appeared as the first step towards a readily understandable, and hence usable, type of motor oil specification for both the engine designer and the petroleum refiner.

Accordingly, the two S.A.E. Sub-Committees met on Jan. 9, 1941 and passed the following recommendations:

"1. In principle the Committee recognizes the use of engine tests as a criterion for acceptable performance of oil.

"2. The Committee tentatively accepts the General Motors '71' and Caterpillar under present recommended procedures for such use with the definite recommendations:

"(a) that the work on the substituting of the Chevrolet engine for the Model 71 Diesel, under its present or modified procedure be expedited by all concerned, and that

"(b) the work toward the shortening of the present Caterpillar procedure be expedited."

In accordance with this recommendation, the two Committees held a meeting on Jan. 14, 1941 for the purpose of discussing, altering, and amending the Chevrolet Varnish Test Procedure towards the end that, for a definite series of reference oils, selected because of their field service, definite and reproducible results could be obtained in, and between, participating laboratories.

There is not much to be gained, at this time, in discussing in detail the first test procedure or the results obtained on the three reference oils, except to state that the results were highly encouraging. Early in the cooperative work it became apparent that all of the factors influencing

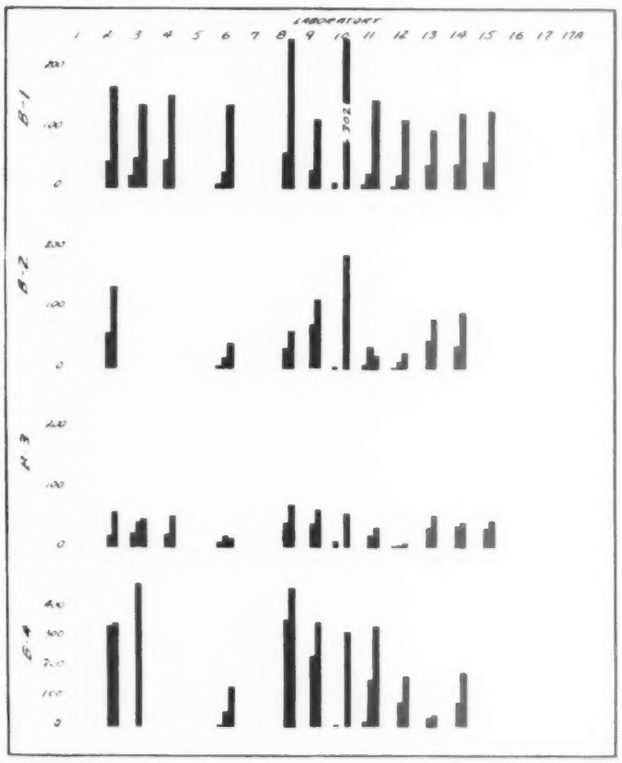

Fig. 1—Naphtha insoluble results in the 36-hour test on the 4 reference oils. Results are expressed in milligrams per 10 grams of the oil under test. Comparative results on the 4 oils in the same laboratory are shown by reading vertically, and for each reference oil between laboratories by reading horizontally

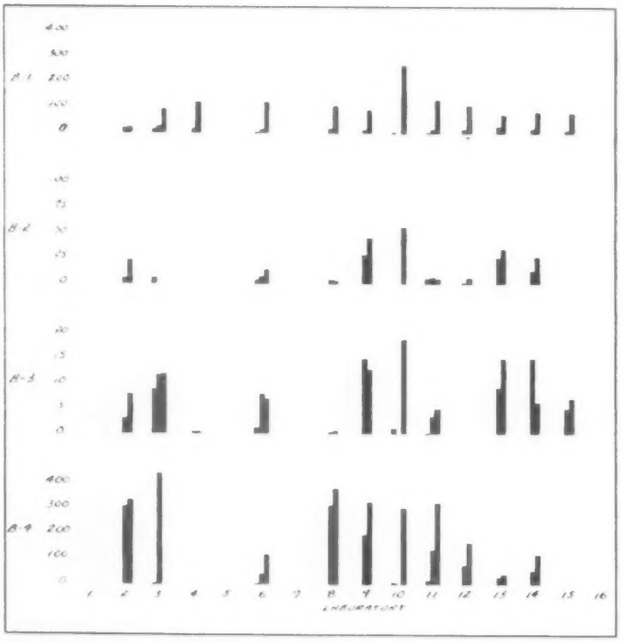

Fig. 2—Chloroform soluble results in the 36-hour test on the 4 reference oils, expressed in milligrams per 10 grams of the oil under test. Comparative results on the different oils in the same laboratory shown by reading vertically, and for each reference oil in the different laboratories by reading horizontally

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the results in this first test procedure were not adequately controlled. Accordingly, some rather intensive work was done by a few laboratories in an effort, first, to account for and explain the magnitude of the influence of these factors alone, and, second, their effect in combination with other test variables.

The net result of the first series of runs, using the so-called 66 2/3 Hour Procedure, together with the additional work of a few of the laboratories, resulted in the so-called 36 Hour Chevrolet Varnish Procedure. The first series of oils which were used as reference oils did not contain an oil of the commonly called "varnishing" type. Consequently, a fourth reference oil was added to the first three, resulting in a rather complete series of reference oils both from the point of view of standardizing an engine and its procedure, as well as giving a good reference oil pattern against which to evaluate an unknown oil or oils. (Conventional oil inspection data for the 4 reference oils is given in Table 1.)

Table 1. Conventional Oil Inspection Data for the 4 Reference Oils Used in the Chevrolet Varnish Tests

Oil	B-1	B-2	B-3	B-4
Gravity	24.3	30.1	29.1	22.5
Flash, °F.	425.	475.	480.	415.
Fire, °F.	475.	435.	450.	455.
Vis. at 100° F. (SSU)	584.	411.4	434.5	527.
Vis. at 210° F. (SSU)	60.2	60.4	60.2	55.5
Vis. index	57.	106.	99.	34.
Color (R)	2.25	9.25	6.	15.
Conradson Carbon (%)	0.29	0.11	0.46	0.039
Pour, °F.	—15.	+15.	—15.	—25.

Rather than discuss the results of the first 36 hour procedure on a numerical basis, a series of bar graphs have been prepared for quick scanning.

(A section of the paper here is omitted which discusses the results of the tests, as shown in Charts 1-6. *A summary of this data is given in the cutlines to the charts.)*

The data, as a whole, is highly satisfactory in that the average participating laboratory has rated the reference oils, from the point of view of both oxidation and corrosion, in the same order as these oils are found to be rated in the field. After all, multi-cylinder laboratory test engines are but another piece of laboratory equipment, much like a viscosimeter, which must be standardized with a standard, or reference, oil to obtain a known series of results. Therefore, the first stage of this work might be defined as the ability to obtain, in and between laboratories using a series of standard test oils, reproducible data in the order in which these same oils are rated in actual service.

The second stage would be the evaluating of unknown oils against the pattern obtained on the known, or standard, test oils.

A further check series, but of SAE 10 grade reference oil, is being run by the participating laboratories and, it is hoped, will be reported by January.

In analyzing the data just submitted, especially when two or three of the laboratories do not check the results generally obtained, it is necessary to determine just why they were out of line. It would appear that, while four laboratories were out of line, based on the general numerical averages obtained, two of these laboratories still rated the oils in the same order as did the majority of the laboratories.

A careful analysis of the results of the work of these laboratories indicates that there is a possibility of a fuel difference between some of the laboratories because it would appear that some fuels may contain, in themselves, natural or added inhibitors or catalysts.

With reference to the fuel itself, while there has been but little time to obtain data to clearly indicate limits of certain fuel ingredients, natural or otherwise, some work has been done which indicates that certain fuel ingredients may have a decided effect upon test engine results. Obviously, if a fuel contains an inhibitor to a greater or lesser extent, it will have but little effect on oils already inhibited. But in the case of oils which are not inhibited, such as B-2 and B-4, the effect would obviously be much more marked. Accordingly, some runs were used placing sulfur compounds in the fuel. It is interesting to note the marked inhibiting effect which was obtained using B-2 oil which, from the previous data, would be found to be a highly corrosive type of oil.

It is understood that the materials used in this series are not necessarily desirable in fuels, but that the runs serve to point out the fact that the inhibiting of lubricating oils in the sump of an engine may be obtained, at least

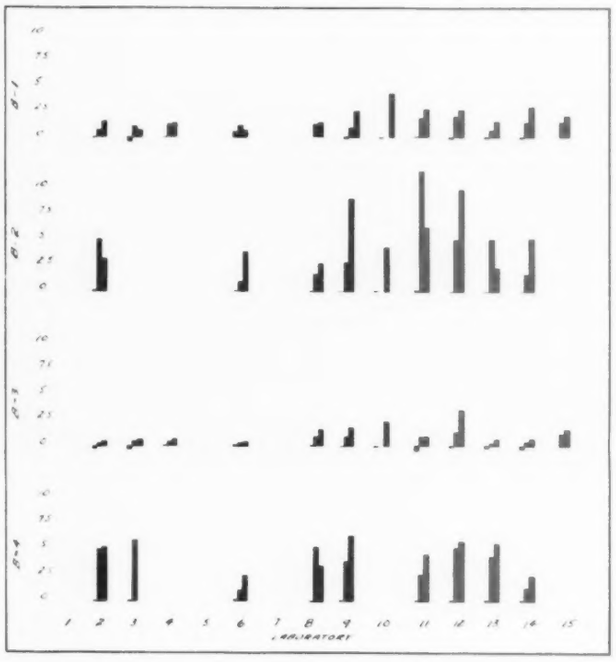

Fig. 3—Neutralization number results on the 4 reference oils, shown on the new oil, the 16-hour and the 36-hour, or drain, samples. Reading vertically gives results on different oils in the same laboratory, reading horizontally the results on same oil in different laboratories. The relative showing of the oils B-3, B-1, B-4 and B-2, is said to be in accord with field results. Comparison with results of corrosion tests showed that neutralization number is not always indicative of corrosion

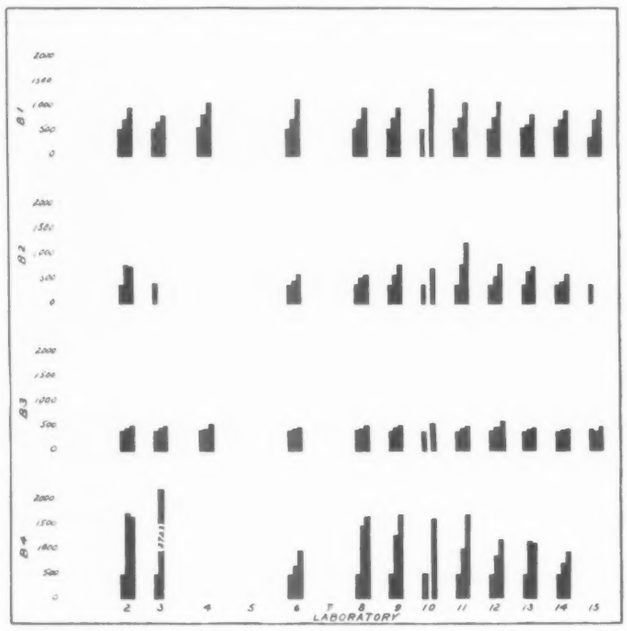

Fig. 4—Results of tests of viscosity at 100°F., shown for the new oil, the 16-hour sample and the final, or drained sample. Lack of final data, on some of the diagrams, is due to the fact that several laboratories cut their run before the 36-hour test period expired because of high acid number or because of actual bearing failure due to corrosion. Reading vertically gives results on different oils in same laboratory, reading horizontally gives results on same oil in different laboratories

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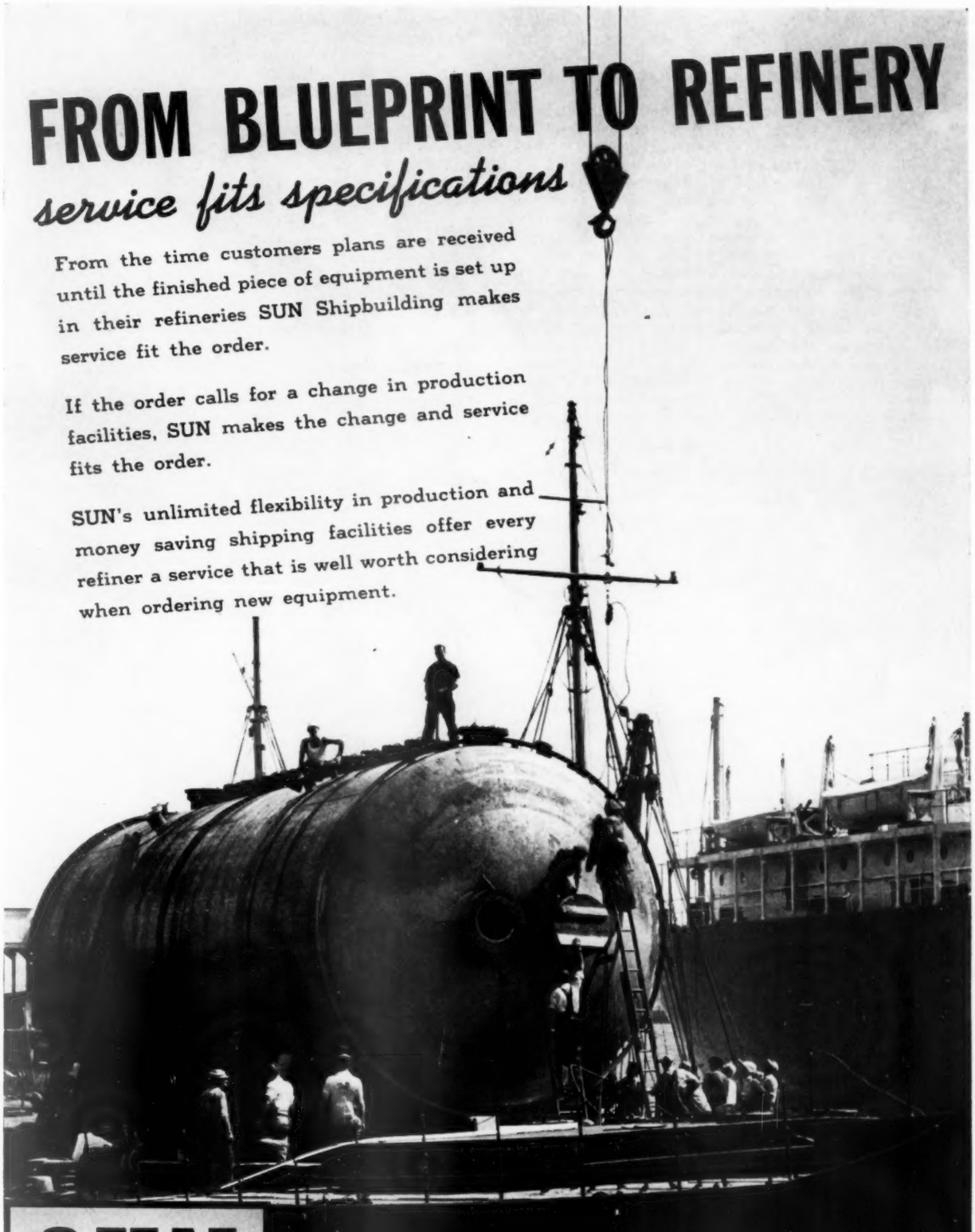

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in part, by inhibiting agents placed, or naturally found, in the fuel. These ingredients find their way into the sump by means of blow-by, which, in the case of this engine, is about one cubic foot per minute, under these test engine conditions.

Fig. 7 illustrates the point that the neutralization number of B-2 oil, which would normally be in the neighborhood of 3.0 to 5.0, under these test conditions in 22 hours, has been held to 0.28 by means of .5% by volume of a sulfur compound placed in the fuel. The second and the third run indicate that, while some inhibiting effect might be obtained by means of another sulfur compound, the effect was not as great as was obtained with the material used in the first run. The fourth run, wherein mineral oil was used as a carrier for the sulfur compound, indicates quite clearly the fact that the neutralization number of even this highly corrosive oil can be maintained at a fairly low level by means of an inhibiting agent placed in the fuel. It should be pointed out that, since the only source of the inhibiting compound is from the blow-by gases, a definite period of time must elapse before the accumulative result of the blow-by gases will become sufficient to cause an inhibiting action of the sump oil, since per unit time but a very small amount of inhibiting material is made available to the sump oil.

Fig. 7—Effect of Fuel on S.A.E. Reference Oil, B-2

(36-hour tests)

Fuel	Sulfur	Neut. Number 16 hrs.	Neut. Number 36 hrs.	Bear. Loss	Remarks
Q	0.06	5.02	3.62	1.49 1.13	Severe oxidation.
Q + DXDS	0.13	0.22	0.28*	0.02* 0.03*	Engine fuel parts stuck up. No oxidation.
Q + CS_2	0.48	2.29	4.08	0.44 1.53	Medium oxidation.
Q + CS_2	1.33	2.91**	...	0.08** 0.22*	Medium oxidation.
Q + DXDS + Oil	0.09	0.46	1.16	0.03 0.04	Test completed satisfactorily. No oxidation.

*Test stopped at 22 hrs.
**Test stopped at 16 hrs.

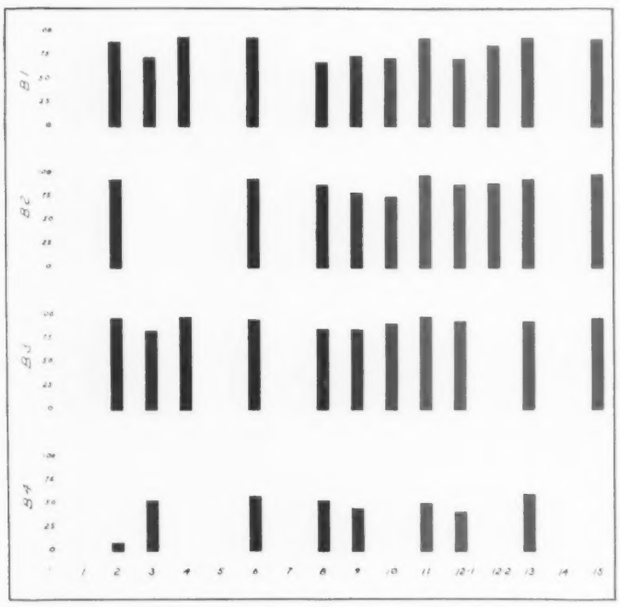


Fig. 5—Rating on engine deposits and sludge in the 36-hour tests on the 4 reference oils, expressed in percentages, since laboratories use different scales, in points, in rating engines. The scoring method used divided the ratings into two portions, sludge and varnish, each engine part being rated separately and the grand average computed from the individual ratings. Vertical readings show results on different oils in same laboratory, horizontal readings results on same oil in different laboratories

(A portion of the paper at this point discusses the effect of lead in the fuel on the oxidation of crankcase oils. From the data compiled to date, it is said, there is about equal evidence presented on both sides of the question as to whether it is harmful or helpful. The effect of lead in fuels on oxidation is termed an important subject, and one on which much more work must be done before even tentative conclusions can be reached. The paper next takes up the effect of air-fuel ratio on oxidation of the oil, as follows:)

Rather early in the cooperative program, erratic results were obtained, especially when the results of the 1941 Chevrolet engine were compared with the results of engines produced in preceding years. The cooperative test program was established in Jan., 1941, based on the current 1941 model engine, but the basis of the data on which the testing procedure was written was on earlier model engines. A few tests had been made on the 1941 engines, and since the engine appeared to be substantially the same as the previous model, it was believed that the proposed test procedure could be used with equally satisfactory results using the 1941 model. However, when the first tests began to be reported by the cooperating laboratories, it appeared that the oils were generally being subjected to more severe conditions in the 1941 than in the 1940 engine.

Tests were then made to study the differences and to determine what factors were responsible for the increased oxidation being obtained by most of the laboratories.

The 1941 engines being new might permit more metal pick-up by the oil, and this metal might catalyze the oil. There was the fear that the oils used as reference oils might be different from the oils previously used, and on which data had been determined to help in selecting the reference oils. The effect of minor changes in engine design might be another factor.

A number of engine runs were then made, trying to

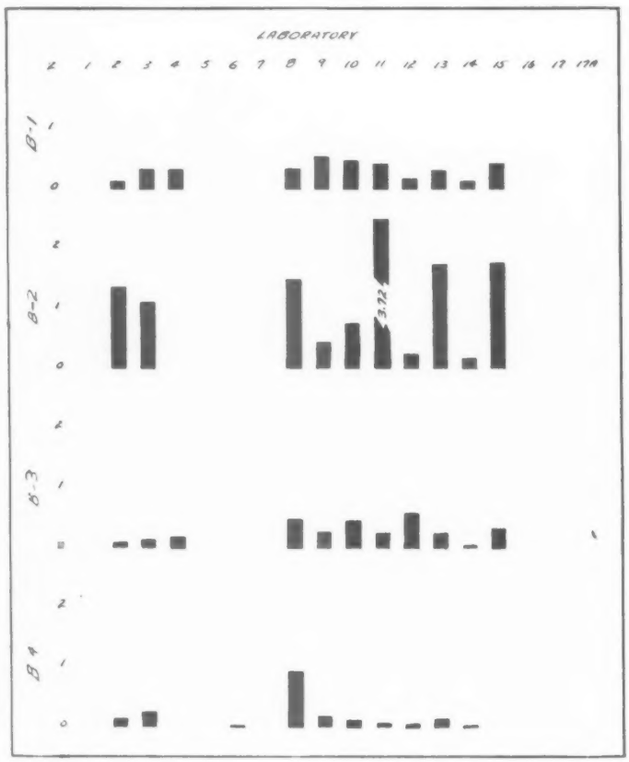
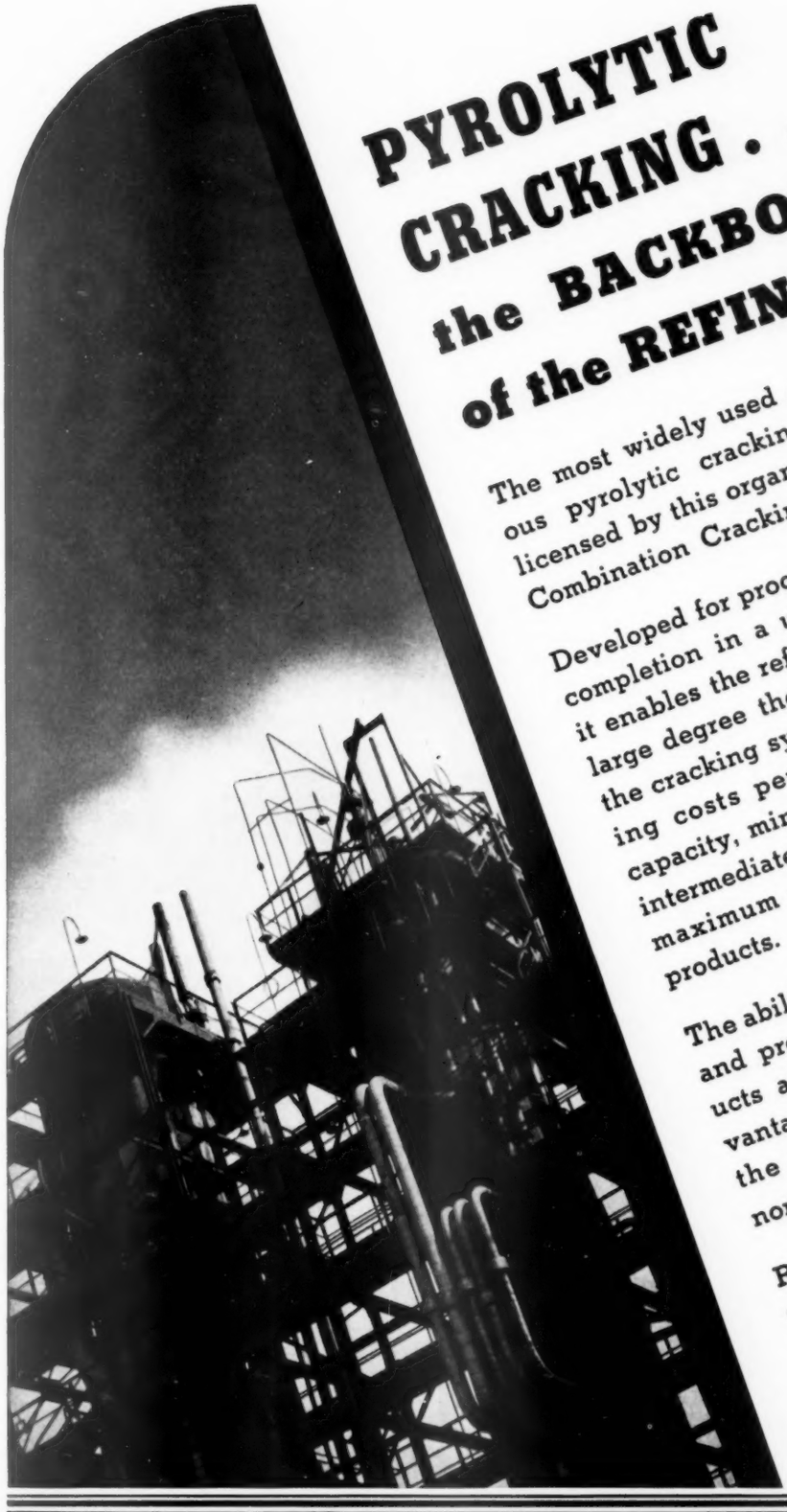


Fig. 6—Corrosion results from the 36-hour tests, expressed in loss in grams of the copper-lead bearings. Vertical readings show results on different oils in one laboratory, horizontal readings results on the same oil in different laboratories. Referring to Fig. 3 (neutralization number) it is noted that, while corrosion of B-3 and B-1 oils checks the expected corrosion when the neutralization number is considered, oils B-2 and B-4 show a decided difference



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RUN Nº	ENGINE MODEL	ENGINE Nº	RUN ON THE ENGINE	OIL LOT	RINGS	AIR FUEL RATIO
1	1940	1	X	A	OLD	—
2	1940	2	Y	B	OLD	10.6
3	1940	2	Z	C	OLD	14.5
4	1941	3	1	D	NEW	—
5	1941	3	2	D	NEW	—
6	1941	3	3	D	OLD	14.2
7	1941	3	5	C	NEW	10.6
8	1941	3	6	D	NEW	14.0
9	1941	4	2	E	NEW	12.9

Fig. 13—Different air-fuel ratios used on 1940 and 1941 Chevrolet engines, in the tests to determine effect of air-fuel ratio on oxidation of crankcase oil

keep all factors constant except the one being studied. The test data were tabulated and studied. Some of the data in connection with these tests are shown in Figs. 5, 13, and 14.

The differences did not appear to be due to metal pick-up caused by the use of new engines. It was apparent that the oil company had kept the various lots of oil uniform, since five lots of oil delivered over a period of about a year gave either good or poor results, depending on some other factor. Various engine design factors were studied and it was found that the air-fuel ratio on the 1941 engine was about one ratio leaner than on the 1940 engine, but the test data showed much larger differences in air-fuel ratios in these tests. Investigation showed that these differences were due to accumulations of dirt which had formed in the carburetors in these tests, and this accidental variable gave a clue to the possible cause of the differences in results.

Since increase in viscosity appeared to be a direct function of oxidation and since from these data engine varnish formation would also seem to be a direct function of increase in viscosity for a given oil, other conditions remaining the same, the oxidation of the lubricating oil would, at least for the air-fuel ratio used, appear to be in direct relation with the air-fuel ratio.

Just why air-fuel ratio had the effect it did have was, perhaps for the moment, not too thoroughly understood. However, since it did have the relation, control limits for the test program had to be set.

The literature contains a good deal of data on air-fuel ratio[1] which indicated that a ratio of approximately 14.5 to 1 has a tolerance of, perhaps, .5 without being too critical on either side. Accordingly, this limit was set up for the cooperative laboratories so that the test program could proceed.

However, the question as to why the air-fuel ratio had the effect it did have, still remained to be answered.

At first we suspected that the leaner the mixture the better the combustion in the combustion chamber, and hence the more oxidation. Measurements of piston crown temperatures did not check this theory. It was then suspected that with leaner mixtures the oil would oxidize more readily on the cylinder walls, and that this oxidized oil would then get past the rings and contaminate the oil in the crankcase. This does occur to some extent, but it is apparent from Diesel experience, in which crankcase oil oxidation does not occur with low crankcase oil temperature, even though the air-fuel ratio is very lean, that the oxidation of the oil on the cylinder walls is not the whole story.

Tests were then made to determine whether the principal source of oxidation of the crankcase oil was on the cylinder walls or in the crankcase.

[1]D'Alleva, B. A. and Lovell, W. G., Research Laboratory Division, General Motors Corporation, "Relation of Exhaust Gas Composition to Air-Fuel Ratio."

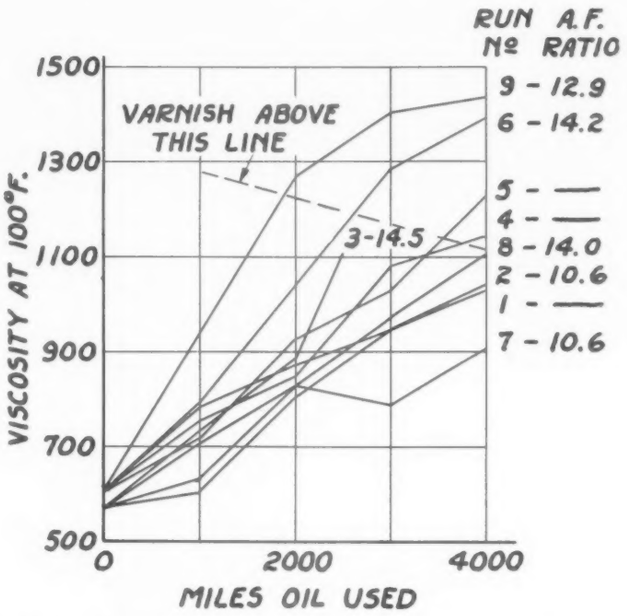

Fig. 14—Increases in viscosity with the leaner air-fuel ratios, other factors remaining the same, indicated the oxidation of the lubricating oil was in direct relation with the air-fuel ratio

It was noted that the atmosphere in the crankcase varies with different operating conditions, depending upon air-fuel ratio and upon the amount of exhaust gas that gets past the piston rings and mixes with the atmosphere in the crankcase. Tests were made to determine this relationship (see Figure 15) and it was noted that although the oxygen content of the crankcase remained about the same with different air-fuel ratios, the amount of carbon monoxide increased greatly with a rich setting of the carburetor.

Fig. 15—Relation of Air Fuel Ratio to Crankcase Atmosphere and Exhaust Gas

Test No.	Test Conditions	Source of Sample	Gas Analysis CO_2	O_2	CO	Air Fuel Ratio
A	3150 R.P.M. road load	Exhaust	14.2	0.5	0.2	15.0
		Crankcase	2.5	17.0	0.3	
B	380 R.P.M. idling	Exhaust	4.1	5.5*	11.6	8.9*
		Crankcase	1.0	17.4	2.9	
C	3150 R.P.M. road load	Exhaust	7.3	0.0	10.6	10.4
		Crankcase	1.8	16.1	2.9	

*Carburetor set too rich to idle perfectly and there was some "missing" therefore air fuel ratio is only approximate.

Tests were then made with different air-fuel ratios and with different atmospheres in the crankcase. To obtain the effect of a rich air-fuel ratio in the crankcase with a lean air-fuel ratio in the combustion chamber, two engines with different air-fuel ratios were set up, side by side, and a portion of exhaust from the "rich" engine was passed into the crankcase of the "lean" engine. In another test, to obtain the possible effect of a higher oxygen content in the crankcase, air was passed through the crankcase. Other tests were made under normal conditions with both lean and rich air-fuel ratios. The data from these tests is shown in Figure 16.

It is apparent from these tests that a very large amount of the oxidation of the crankcase oil occurs in the crankcase and that carbon monoxide (or possibly hydrogen, or other reducing gas) is the material that, by acting as an inhibitor in the crankcase, decreases the rate of oxi-

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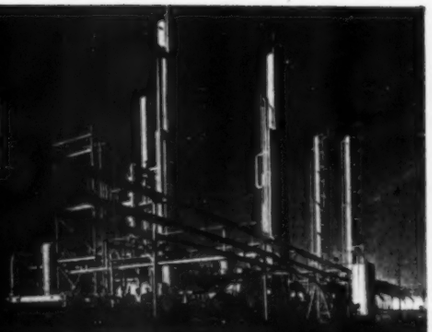

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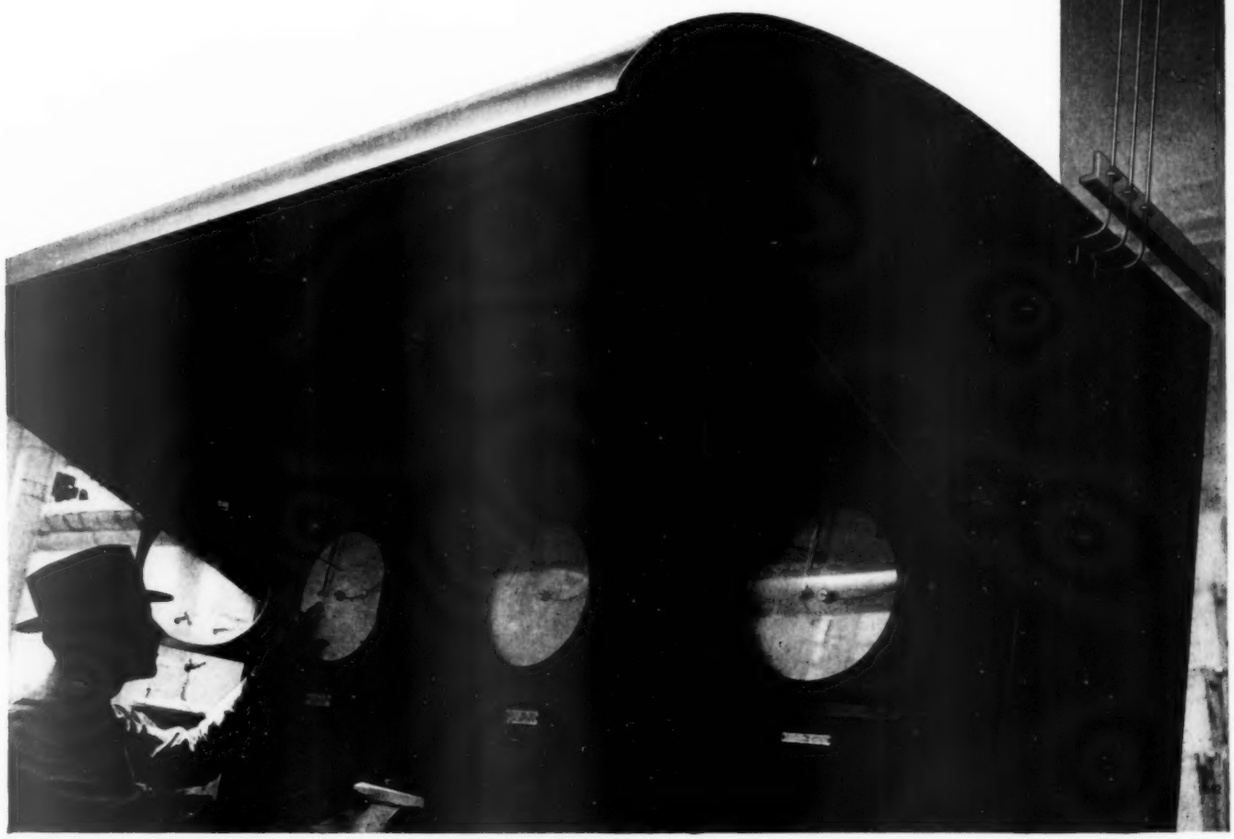


Fig. 16—Effect of Air Fuel Ratio

Test No.	Air-Fuel Ratio	Special Conditions	Exhaust Gas CO_2	Exhaust Gas O_2	Exhaust Gas CO	Crankcase Oil (1000 Mi.) Neut. No.	Naph. Insol.	Con. Carb.	Vis. @ 100°F.
1	14.2	Lean Air-Fuel Ratio	13.9	0.3	0.9	2.23	.46	1.58	267
2	15.1*	*	14.3 4.3**	0.7 10.1**	0.4 5.3**	.45	.84	.83	206
3	14.2	***	13.8	0.1	2.0	1.45	.97	1.71	283
4	9.8	Rich Air-Fuel Ratio	6.6	0.0	13.4	.95	.70	1.04	215

*Exhaust gas from another engine with very rich carburetor was passed into the crankcase.
**Atmosphere of crankcase due to passing exhaust gas from "rich" air-fuel ratio engine through crankcase.
***3 cu. ft. of air per min. was passed through the crankcase.

dation when the air-fuel ratio is rich. Of course, in order to prevent the oxidation of the crankcase oil, when the air-fuel ratio is "lean" and there can be no inhibiting effect of carbon monoxide in the crankcase, some other suitable inhibitor should be present in the crankcase oil.

(The text here brings out that a 14.5 air-fuel ratio is such that a fair plus or minus tolerance figure will have little effect on the test results. Further, a 14.5 to 1 ratio is comparable with field experience today and, from the point of view of fuel economy, it would appear necessary that automobile engines be run on the lean side.

The one drawback to this ratio, it is shown, is that the ratio is too severe, with all other conditions remaining the same, in that carbon monoxide in the crankcase acts as an addition inhibitor of oxidation.

Tests were run to determine the desirable oil sump temperature for the selected air-fuel ratio, the data indicating that oil sump temperature was the controlling factor, once the air-fuel ratio was held in the range of from 14 to 15 to 1.

"The problem, therefore," states the paper, "became one of setting the test conditions such that, from the point of view of heavy duty operating conditions, a good commercial oil would 'pass', while a medium or poor oil would 'fail' to a lesser, or greater, extent."

The proposed test conditions for the standard 36-hour test call for an oil sump temperature of 280 F. and an air-fuel ratio of 14.5 to 1.)

The conclusions reported in the paper were:

"1. by means of carefully controlled operating conditions, production multi-cylinder engines can be used, in conjunction with a series of standard test oils, to give a test pattern for these oils which are reproducible in themselves, and which will coincide with results obtained on these oils in service;

"2. as the proper test oil pattern is obtained, a valuable and useful means of testing unknown oils is made possible by describing the unknown oil in terms of the test pattern of the known oils;

"3. the description, or specification, of heavy duty motor oils, for oxidation and corrosion characteristics is, for the moment, at least, most easily achieved by evaluating this type of oil in terms of a known test oil pattern;

"4. the 36 hour Engine Test Procedure is a satisfactory method for the evaluation of oils for heavy duty service with respect to their oxidation characteristics, but that other tests are required to measure certain other properties, such as resistance to ring sticking, resistance to valve sticking, tendency to form carbon in various locations in and around the combustion chamber, and etc.;

"5. not only can unknown oils be evaluated by means of the known test oil pattern, but so can engines of both present and future design."

The laboratories co-operating in the Chevrolet Varnish Test procedure were: Atlantic Refining, Caterpillar Tractor, Continental Oil, DuPont, General Motors, Gulf Refining, Kendall Refining, Lubri-Zol, Pure Oil, Quaker State, Shell Oil, Sinclair Refining, Socony-Vacuum, Standard Oil of California, Standard Oil Development, Sun Oil, The Texas Co.

Engine Deposits Studied By SAE Committee

The nature and location of troublesome "lacquer" or "varnish" deposits on the surfaces of internal combustion engines is being studied by a special committee of the Society of Automotive Engineers, which submitted a progress report at the National Transportation and Maintenance meeting of the SAE in Cleveland, Nov. 13-14.

This study is part of a comprehensive program which may include an effort to secure a uniform method of rating such deposits, as a feature of laboratory engine tests, and to find methods for preventing and removing engine deposits.

Data on the location and nature of these deposits, and on their relative harmfulness, is to be secured through a questionnaire to be sent to operators of large fleets of cars and trucks, including oil companies. The form of questionnaire, with minor changes, was approved at the Cleveland meeting. It seeks, from the experience of the fleet operators, the location of deposits, description of the deposits, reason for their undesirability, and the order of undesirability, for the following classification of engine surfaces:

Combustion chamber: (a) combustion chamber surface; (b) spark plug; (c) injector and turbulence chamber.

Piston and cylinder wall: (a) piston head, top; (b) piston head, underside; (c) piston skirt; (d) piston ring, compression; (e) piston ring, oil control; (f) cylinder wall.

Valves and valve gear: (a) exhaust valve, top; (b) exhaust valve head, underside; (c) exhaust valve seat; (d) exhaust valve stem; (e) intake valve head, top; (f) intake valve head, underside; (g) intake valve seat; (h) intake valve stem; (i) valve or push rod chamber; (j) overhead valve gear; (k) valve lifters, mechanical or hydraulic.

Crankcase: (a) timing gear housing; (b) crankcase surfaces; (c) oil intake screen; (d) oil passage and piping; (e) oil filter system; (f) crankcase pan; (g) bearings; (h) crankcase ventilation system.

Fuel and induction systems: (a) air cleaner, air horn; (b) carburetor choke valve; (c) carburetor venturi; (d) carburetor bowl; (e) carburetor jets and fuel passages; (f) intake manifolds and ports; (g) fuel pump; (h) fuel lines; (i) fuel tank; (j) fuel filter screens; (k) fuel injectors; (i) governor mechanism.

Exhaust system: (a) exhaust manifold and ports; (b) exhaust pipe; (c) muffler.

Cooling system: (a) radiator; (b) water pump and hose connections; (c) engine cooling water passages.

The questionnaire also asks fleet operators to advise as to methods they have found successful in reducing or preventing accumulation of undersirable engine deposits, and in removing engine deposits.

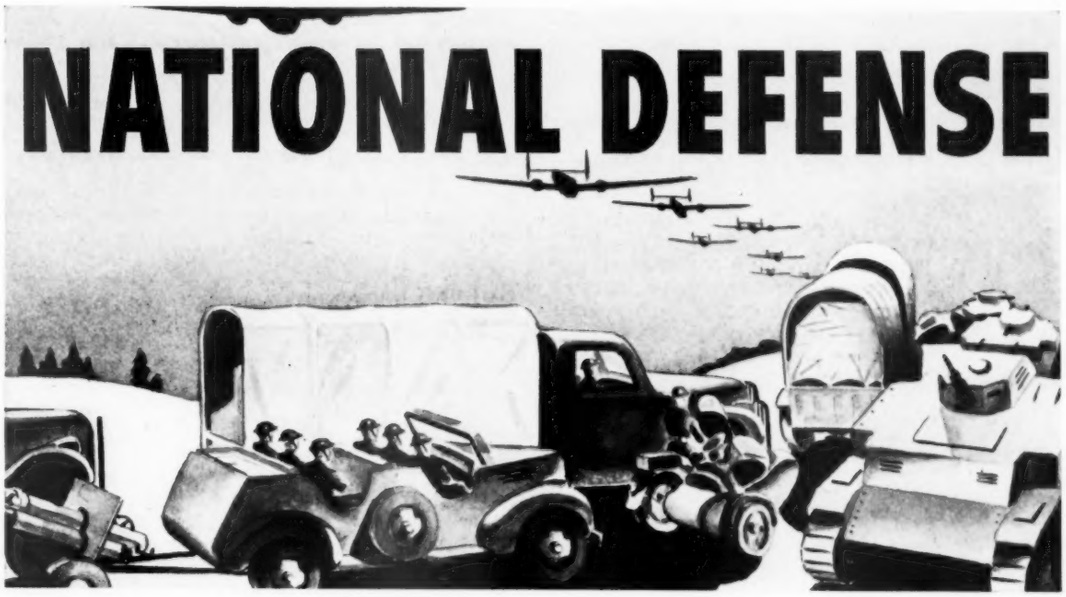
Recognizing the present confusion in the definition of the various types of engine deposits, the special committee's progress report presented at Cleveland suggested the following nomenclature be agreed on:

"Lacquer—A resinous material, either hard or semi-hard, found in crankcases, on exhaust valve stems, on pistons or cylinder walls or on valve gear.

"Gum—Resinous material found in intake manifolds, carburetors, on intake valve stems and heads or in intake ports.

"Sludge—(a) Cold sludge, formed through low temperature operation and moisture collection in crankcase; (b) hot sludge; two types: (1) a mud type sludge formed

NATIONAL DEFENSE



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through oxidation of the oil during normal or high temperature operation, (2) coffee-grounds sludge, the granular carbon type sludge formed in oil pans, oil sumps and oil screens.

"Carbon—Describe as soft or hard, heavy or light, oily or dry.

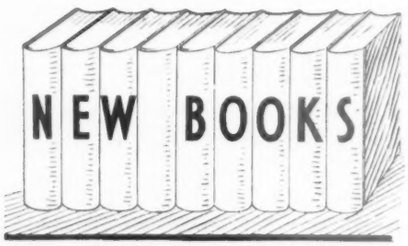
"Combustion chamber deposits—Describe as to color, carbonaceous appearance, hard or soft, granular or flaky and amount."

Members of the special committee undertaking the study of engine deposits, and officials of the Society of Automotive Engineers sponsoring the work, say there are no indications that the lacquer or varnish deposits are today more of a problem to motor vehicle operators in the proper lubrication of their equipment, than in past years.

They believe that the experience data available is sufficient to warrant the present study of means for preventing and removing such deposits. The progress report stated:

"It is quite normal to find deposits on the various surfaces of internal combustion engines. Operating conditions, design, fuels and lubricants can all contribute to the formation of deposits. Past experience has shown that many of the deposits have little or no effect on the operating efficiency of an engine. To attempt to keep an engine free of all such deposits is merely extra operating expense."

Members of the group carrying on the study of engine deposits for the SAE, known as Sub-Committee B-1, are: Errol J. Gay, Detroit, Ethyl Gasoline Corp., chairman; R. W. Cass, Cleveland, chief engineer, White Motor Co.; E. S. Pardoe, engineering assistant to the president, Capital Transit Co., Washington, D. C.; E. Dunning, assistant manager, products application division, Shell Oil Co., New York.



Chemical Engineers Handbook

(Second Edition)

Containing over 3000 pages, this handbook should find its way as a working tool to the desks of all petroleum engineers. This edition has been greatly expanded and brought up to date with the developments in chemical engineering principles since the first edition, published in 1934.

John H. Perry, of the du Pont Co. is editor-in-chief and more than 90 outstanding chemical engineers have contributed to the volume, among them several with long experience in the design, methods of processing and economics entering into the petroleum refining industry.

All sections of the book, except those on mathematics, factors in chemical plant location, accounting and cost finding, and reports and letter writing, have been either rewritten or thoroughly revised. Several new sections have been added, among which those on Solvent Extraction, Bulk Packaging, Technical Calculations, Thermodynamics and the Tables on Pipes and Gauges, have considerable value for the petroleum chemist and engineer. The new index of 70 pages, is comprehensive and readily usable.

The price of Chemical Engineers Handbook (second edition) is $10. It can be bought from NPN, 1213 West Third St., Cleveland.

* * *

A study of the effect of operating Diesel engines underground, where the atmosphere might contain methane or other hydrocarbon gases given off in mine workings, is contained in U. S. Bureau of Mines report, "Effect on Exhaust-Gas Composition of Operating Engines in Mixtures of Normal Air and Natural Gas". This is the third in a series on Diesel engines underground.

* * *

Reports on Oklahoma Crudes

An analysis of crudes from Oklahoma fields southwest of the Arbuckle Mountains is contained in Bureau of Mines Report of Investigations 3592, dated, October, 1941. The report, written by E. L. Garton, of the Bartlesville station of the Bureau, indicates the crude in this area is similar to other Oklahoma crudes, except higher in sulphur.

Analysis is given of 27 samples, with a bibliography of 32 references to other publications on crude analyses. Copies of the report may be obtained from Supt. of Documents, Washington.

Members of API Refining Committee are Named

The Refining Division of the American Petroleum Institute, at the A.P.I. meeting at San Francisco, Nov. 3-7, elected the following members of the general refining committee:

C. H. Barton, Tide Water, New York; W. F. Burt, Socony-Vacuum, New York; O. L. Cordell, Bareco Oil Co., Tulsa; E. D. Cumming, Shell, New York; A. D. David, Bradford Penn Refining Corp., Clarendon, Pa.; M. Halpern, Texaco, New York; J. L. Hanna, California Standard, San Francisco; G. W. Hanneken, Ohio Standard, Cleveland; A. M. Kelley, Richfield Oil Corp., Los Angeles; W. W. Lowe, Cities Service, New York; T. M. Martin, Lion Oil Refining Co., El Dorado, Ark.; G. G. Oberfell, Phillips, Bartlesville; Walter Miller, Continental, Ponca City; M. G. Paulus, Indiana Standard, Chicago; A. E. Pew, Jr., Sun, Philadelphia; W. A. Slater, Gulf, Pittsburgh; C. F. Smith, New Jersey Standard, New York; G. H. Taber, Jr., Sinclair, New York; C. B. Watson, Pure, Chicago; and W. S. Zehrung, Pennzoil Ref. Co., Oil City, Pa.

The following were appointed by A.P.I. President Boyd:

Paul G. Blazer, Ashland Oil & Refining Co., Ashland, Ky.; C. L. Henderson, The Vickers Petroleum Co., Wichita, Kans.; E. J. Henry, Atlantic, Philadelphia; R. B. Jones, Panhandle Refining Co., Wichita Falls, Tex.; and W. L. Stewart, Jr., Union Oil of California, Los Angeles.

Achievement Award Given Dow Chemical

Dow Chemical Co. was presented the current award of the journal, Chemical and Metallurgical Engineering, for outstanding chemical engineering achievement. The committee making the award consisted of 39 leading U. S. chemical engineers.

Among the principal new achievements of the Dow company is the installation of a plant at Freeport, Texas, for the first commercial ingot of any metal to be taken from sea water at any time in history. This metal, magnesium, is the third most abundant material in the earth's crust, and is used for both chemical and structural purposes.

Dow Chemical is the fifth company to be given this award. First was Carbide & Carbon Chemicals Corp., for developing a chemical industry based on the hydrocarbons of petroleum and natural gas. Fourth award, in 1939, was to Standard Oil Development Co., for the development of new aviation fuels and synthetic chemical products from petroleum.

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Try him—free—in your own gasoline and find out

We'll gladly abide by the result

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New Patents

Compiled by R. E. Burnham, patent and trade-mark attorney, 511 Eleventh St., NW., Washington, D. C., from whom copies may be obtained at rate of 25c each. State number of patent and name of inventor when ordering.

Treating fatty oils and like—James M. Whiteley, Elizabeth, and Luther B. Turner, Roselle Park, N. J., assignors to Standard Oil Development Co. Filed Mar. 15, 1938. No. 2,260,417.

Gasoline dispensing hose—David J. Nelson, Salisbury, Md., assignor to Martin & Schwartz, Inc., same place. Filed Mar. 18, 1940. No. 2,260,537.

Gel and lubricant made therefrom—Samuel S. Kistler, West Boylston, Mass., assignor to Monsanto Chemical Co.

Process of inhibiting oxidation of hydrocarbons—Wilbur E. Robbins, Norco, La., and Richard R. Zundel, Wood River, Ill., assignors to Shell Development Co. Filed Sept. 7, 1939. No. 2,260,683.

Apparatus for extinguishing oil fires—Maximillian B. Anfenger, San Francisco, Calif., assignor to Standard Oil Co. (Calif.) Filed Aug. 29, 1939. No. 2,260,733.

Process for deasphalting oil—Lyle Dillon and Claude E. Swift, Glendale, Calif., assignors to Union Oil Co. (Calif.) Filed Apr. 27, 1936. No. 2,261,108.

White oil refining—Francis M. Archibald, Elizabeth, N. J., assignor to Standard Oil Development Co. Filed Dec. 30, 1939. No. 2,261,206.

Solvent treating petroleum oils—Chester L. Read, Westfield, N. J., assignor to Standard Oil Development Co. Filed Nov. 19, 1938. No. 2,261,287.

Centrifuge for dewaxing oils—Hans O. Lindgren, Appelviken, Sweden. Filed May 24, 1938. No. 2,261,394.

Process for dewaxing hydrocarbon oils—Curt F. Holm, Angby, Sweden. Filed Apr. 21, 1939. No. 2,261,724.

Solvent treating process—James W. Whiteley, Jr., Westfield, N. J., assignor to Standard Oil Development Co. Filed Mar. 4, 1939. No 2,261,780.

Removing solvents from raffinates—Joe L. Franklin, Jr., Goose Creek, Tex., assignor to Standard Oil Development Co. Filed Nov. 30, 1939. No. 2,261,799.

Dewaxing process—Per K. Frolich, Westfield, and Jones I. Wasson, Townley, N. J., assignors to Standard Oil Development Co. Filed July 29, 1938. No. 2,261,801.

Refining hydrocarbon distillates—Meyer S. Agruss and George W. Ayers, Jr., Chicago, assignors to Pure Oil Co. Filed Oct. 2, 1939. No. 2,261,866.

Gasoline extraction—Thomas V. Moore and Stuart E. Buckley, Houston, Tex., assignors to Standard Oil Development Co. Filed May 11, 1940. No. 2,261,927.

Method for recovering spent adsorbent material—Fred L. Fast, Woodbury, N. J., assignor to Socony-Vacuum Oil Co. Filed Oct. 1, 1938. No. 2,261,151.

Hydrogenation catalyst—Walter F. Huppke, Lomita, Calif., assignor to Union Oil Co. (Calif). Filed Jan. 8, 1937. No. 2,261,159.

Compression ignition engine fuel—Gould H. Cloud, Elizabeth, N. J., assignor to Standard Oil Development Co. Filed Apr. 21, 1939. No. 2,261,227.

Compression ignition engine fuel—Raphael Rosen, Elizabeth, N. J., assignor to Standard Oil Development Co. Filed Dec. 22, 1938. No. 2,261,290.

Colored wax composition and process for producing—Wayne A. Proell, Chicago, assignor to Standard Oil Co. (Ind.) Filed Dec. 1, 1939. No. 2,261,451.

Gas main treating oil—Minor P. Andrews, Brooklyn, N. Y., assignor to Sun Oil Co. Filed May 5, 1937. No. 2,261,669.

Lubricant; halogenated hydrocarbon lubricant; halogenated extreme pressure lubricant, and hydrocarbon lubricant containing halogen—William A. Whittier, Kenilworth, Ill., assignor to Pure Oil Co. Filed Dec. 18, 1937. Nos. 2,261,862, 2,261,863, 2,261,864, and 2,261,865.

Natural gasoline absorption and distillation system and process—Edward G. Ragatz, San Marino, and Donald E. McFaddin, Alhambra, Calif., assignors to Union Oil Co. (Calif.) Filed Apr. 24, 1937. Nos. 2,262,201 and 2,262,202.

Lubricant—Bert H. Lincoln and Gordon D. Byrkit, Ponca City, Okla., assignors to Continental Oil Co. Filed May 26, 1939. No. 2,262,019.

Apparatus for reactivating catalysts — George E. Liedholm, Long Beach, Calif., assignor to Shell Development Co. Filed Oct. 30, 1940. No. 2,262,427.

Stabilized petroleum distillate—John W. Orelup, Short Hills, N. J. Filed May 31, 1938. No. 2,262,466.

Lubrication—Matthew Fairlie and Leonard E. Beare, Hammond, Ind., assignors to Sinclair Refining Co. Filed July 15, 1938. Nos. 2,262,526, 2,262,527, 2,262,528, and 2,262,529.

Process for improvement of knock rating of gasoline—Maurice H. Arveson, Flossmoor, Ill., assignor to Standard Oil Co. (Ind.) Filed June 6, 1938. No. 2,263,026 .

Conversion of hydrocarbons—Ernest W. Thiele, Chicago, Ill., assignor to Standard Oil Co. (Ind.) Filed Jan. 28, 1938. No. 2,263,056.

Decolorizing oil—Wayne A. Proell, Chicago, Ill., assignor to Standard Oil Co. (Ind.) Filed Dec. 15, 1939. No. 2,263,102.

Process of manufacturing motor fuel — William E. Forney, Merchantville, N. J., assignor to Cities Service Oil Co. Filed Feb. 19, 1936. No. 2,263,266.

Apparatus for treating hydrocarbons—Nicholas Menshih, Cranford, N. J., assignor to Standard Oil Development Co. Filed July 30, 1938. No. 2,263,363.

Suppressing coking on surfaces (in cracking hydrocarbons)—Edward B. Peck, Elizabeth, and Peter J. Gaylor, Union, N. J., assignors to Standard Oil Development Co. Filed June 24, 1939. No. 2,263,366.

Emulsion process for deoiling and dewaxing—Donald E. Carr and William M. Sopher, Long Beach, Calif., assignors to Union Oil Co. (Calif.) Filed Dec. 23, 1936. No. 2,263,535.

Lubrication—Bert H. Lincoln and Alfred Hendriksen, Ponca City, Okla., assignors to Lubri-Zol Development Co. Filed Mar. 19, 1937. No. 2,262,773.

Catalyst (for polymerization of olefins)—James W. Jean, Altadena, Calif. Filed Jan. 31, 1939. No. 2,262,804.

Lubricant—Eugene Lieber, Linden, N. J., assignor to Standard Oil Development Co. Filed Oct. 12, 1938. No. 2,262,809.

Lubricant—Arnold J. Morway, Roselle, and John C. Zimmer, Hillside, N. J., assignors to Standard Oil Development Co. Filed Aug. 13, 1938. No. 2,262,813 .

Flushing oil composition—John A. Edgar and Harold A. Woods, Martinez, Calif., assignors to Shell Development Co. Filed Sept. 24, 1940. No. 2,262,926.

Mercaptan recovery — Thomas F. McCormick, Oakland, and Arthur Lazar, Berkeley, Calif., assignors to Tide Water Associated Oil Co. Filed Dec. 27, 1935. No. 2,263,043.

Apparatus for pelleting carbon black — Samuel C. Carney, Bartlesville, Okla., assignor to Phillips Petroleum Co. Filed May 16, 1939. No. 2,263,118.

Processes for recovering nitrogen bases—Arthur Lazar, Berkeley, and Lionel S. Galstaun, San Francisco, Calif., assignors to Tide Water Associated Oil Co. Filed June 20, 1938. Nos. 2,263,172 and 2,263,176.

Diesel fuel—Gould H. Cloud, Linden, N. J., assignor to Standard Oil Development Co. Filed Mar. 1, 1940. No. 2,263,234.

Motor fuel—George H. Freyermuth, Scarsdale, and Anthony E. Robertson, New York, N. Y., assignors to Standard Oil Development Co. Filed Aug. 24, 1939. No. 2,263,239.

Art of improving lubricating oils—Melvin F. Fincke, New York, N. Y., and Jeffrey H. Bartlett, Cranford, N. J., assignors to Standard Oil Development Co. Filed Feb. 24, 1938. No. 2,263,265.

Color stabilization of white petroleum oils—Henry C. Paulsen, Elizabeth, N. J., assignor to Standard Oil Development Co. Filed May 4, 1940. No. 2,263,273.

Reaction of petroleum oils wih sulphur dioxide and chlorine—Cortes F. Reed, Anoka, Minn. Filed June 30, 1938. No. 2,263,312.

Mineral oil compositions and improving agent therefor—Orland F. Reiff, Woodbury, N. J., assignor to Socony-Vacuum Oil Co. Filed Apr. 10, 1940. No. 2,263,445.

Conversion of hydrocarbons — Crawford H. Greenewalt, Wilmington, Del., assignor to E. I. du Pont de Nemours & Co. Filed Dec. 30, 1937. No. 2,263,557.

Lubrication—Frederick H. Downing, Carneys Point, Anthony F. Benning, Penns Grove, and Frank W. Johnson, Pennsville, N. J., assignors to E. I. du Pont de Nemours & Co. Filed Nov. 24, 1939. No. 2,263,618.

Process of preparing resins and products thereof—William J. Sparks, Cranford, and Donald C. Field, Roselle Park, N. J., assignors to Standard Oil Development Co. Filed Nov. 19, 1938. No. 2,263,654.

Sludge coking process—Carroll D. Fentress, Hammond, Claude P. McNeil, Whiting, and Edwin G. Wiley, Hammond, Ind., assignors to Standard Oil Co .(Ind.) Filed Nov. 9, 1938. No. 2,263,766.

Treatment of machine elements to facilitate breaking in—Alvah L. Snow, San Francisco, Calif., assignor to Standard Oil Co. (Calif.) Filed May 2, 1939. No. 2,263,905.

Reaction of unsaturated aldehydes with dissimilar aldehydes and ketones—Clyve C. Allen, San Francisco, Calif., assignor to Shell Development Co. Filed Mar. 13, 1939. No. 2,264,034.

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